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SOME INTERIM NOTES ON THE PREVAILING EPIDEMIC, FROM THE PUBLIC HEALTH VIEWPOINT.¹

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After having been held at bay for over three months by a fine exposition of the capabilities of maritime quarantine on the part of the Commonwealth authorities, the prevailing pandemic of influenza invaded this State from Victoria at the end of January. The invasion was well defined. The public health authorities and the whole medical profession of the State had been on the look-out to detect cases of influenza since at least the date of the influenza conference in Melbourne on November, 1918, and it seems to be generally agreed by the medical profession that rarely has New South Wales been so free from infectious catarrhs and from pneumonia as during the last two months of 1918 and the first month of this year.

As soon as the existence of pneumonic influenza in New South Wales was ascertained on January 27, the State was, in accordance with the resolutions arrived at by the influenza conference, formally declared to be infected and the restrictions against interstate intercourse agreed to by the various Governments as the result of the conference, automatically came into effect. A day later the State of Victoria also declared itself infected. Under the conference agreement this action should have restored free communication between the two infected States, but it soon became clear that Victoria was much more extensively infected than this State, and the New South Wales Government found itself impelled to impose restrictions upon the passage into this State of persons from Victoria in order to minimize, as far as possible, the importation of infection.

The Course of the Epidemic.

During the early weeks, the epidemic spread very slowly. The total weekly number of cases which came to the knowledge of the Health Department crept slowly from 12 in the first week to 21 in the second and so on up to 64 in the sixth. After that the number of cases increased very rapidly, the outbreak becoming almost explosive in character. The figures in the accompanying table show only the number of those patients who were removed to hospital. The deaths, however, include all those known to have occurred. At the beginning every patient with influenza who could be laid hands on, was removed to hospital, whether the attack was severe or mild in character, but it soon became evident that attacks so mild as to be regarded by the patient, and even by the medical attendant, as merely a severe cold or an ordinary infectious catarrh, were becoming numerous and were capable of passing on the infection in a very virulent

form. For example, a young man in one of the western suburbs, who had a most severe attack, was infected by his sister, who escaped so lightly that she did not take to her bed at all and merely complained of having a headache and a "nasty chill." Three other members of the family suffered similar mild attacks. This is merely an illustration of a common occurrence.

During the last few weeks the accommodation at the metropolitan hospitals, permanent and temporary, has been severely taxed, and to obtain the best value from the hospitals, admission to them has been, as far as possible, limited to patients who were seriously ill and whose domestic circumstances did not permit of their receiving proper attention at home.

It is worthy of note that the severest cases often appeared to be the most infectious. Very frequently one has observed a fatal or very severe attack to be followed by an extensive outbreak among those who in any way came into contact with the patient. The Newcastle outbreak is a good example of this.

After discussing the extent of the epidemic with medical practitioners and hearing the accounts of the visiting medical staff of the Health Department, officers-in-charge of relief depôts and others who have had opportunities of judging, I have very roughly estimated the number of cases of influenza in Sydney at the beginning of this week at not less than 30,000. The majority of these, no doubt, represent slight attacks, but there were 1,500 patients under treatment in the various hospitals, all of whom were suffering from more or less severe forms of influenza. The mortality toll from the disease at the same time ranged from 20 to 30 deaths daily.

The source of the epidemic in the town of Newcastle is interesting and instructive, inasmuch as in some degree it resembles a laboratory experiment from the close observation which was focussed upon its origin.

At the time of its occurrence Newcastle is believed to have been quite unusually free from infectious colds and catarrhs of any sort, and, therefore, the phenomena attending this outbreak were not obscured by any confusion arising from difficulties of diagnosis between the exotic and indigenous types of influenza.

On February 25, a seaman, A.B., aged 28, was admitted into "D" ward of the Newcastle Hospital from the s.s. *Ooma*, which had that day arrived from Melbourne. A.B.'s illness had been diagnosed as typhoid fever by the surgeon on board the *Ooma*, Dr. MacNaughton and his wife, who is also a medical practitioner. On arrival at Newcastle the Acting-Port Health Officer saw A.B., concurred in the diagnosis of Dr. and Mrs. MacNaughton and recommended the seaman's admission to the hospital. He was seen also by several members of the honorary and resident medical staff, all of whom agreed with the diagnosis of typhoid fever.

¹ Read at a Meeting of the New South Wales Branch of the British Medical Association on April 11, 1919.

The patient went down hill and became cyanosed, and on the evening of Sunday, March 2, the medical staff considered the possibility of the case being one of pneumonic influenza. That night he died and within 24 hours of his death five nurses, two wardsmen, one of the honorary medical staff and six patients in "D" ward had all become attacked by the symptoms of influenza. Before the Newcastle Hospital was cleared of the disease 35 persons were infected there.

A post-mortem examination of A.B.'s body disclosed no evidences of typhoid fever, but the findings were consistent with those of death from pneumonic influenza.

Between the time of A.B.'s admission and his death a good many visitors were admitted to the ward in which he lay. Probably a proportion of these persons became infected and took the infection home, and by March 12, *i.e.*, 10 days after A.B.'s death, cases of influenza began to come under observation in neighbourhoods distant from the hospital. From then on the infection has gradually spread in Newcastle.

Several highly interesting points emerge from the observations made on this Newcastle outbreak. I have not had leisure to elaborate them here, but it may be pointed out that though A.B. became ill on February 20 and entered the Newcastle Hospital on February 25, he did not apparently infect anyone in the hospital until February 28 at the earliest, though no precautions against infection were being observed in the hospital at that time. Another important observation was that, while his illness was of a very severe type, most of those infected by him had mild attacks. One of those infected by him, who underwent a moderately mild attack, passed on the infection to a woman who had the disease in a virulent form and died after not many hours' illness.

Course of the Epidemic in Sydney and Suburbs.

Week Ending—	Patients Admitted to Hospital.		Deaths from	
	Admissions.	Daily Average.	Influenza in Sydney and Suburbs, including those in Hospitals.	
Broken Period 6 Days Ending				
February 1, 1919	12	..	2	.. 0
February 8, 1919	21	..	3	.. 0
February 15, 1919	47	..	6.71	.. 4
February 22, 1919	48	..	6.85	.. 4
March 1, 1919 ..	46	..	6.57	.. 3
March 8, 1919 ..	64	..	9.14	.. 1
March 15, 1919 ..	133	..	19.00	.. 6
March 22, 1919 ..	272	..	38.85	.. 15
March 29, 1919 ..	444	..	63.42	.. 88
April 5, 1919 ..	765	..	109.28	.. 160
	1,852			281

Measures of Control.

One confesses to a feeling of disappointment at the failure of the ordinary measures of epidemic control which has been experienced. This State was warned beforehand of the approach of the epidemic and, as far as can be ascertained, more thorough preventive measures were employed here than in most other countries.

Compulsory notification and the segregation of patients and contacts, which were most strictly enforced during the first eight weeks of the epidemic, have proved almost valueless. This is due to—

- the spread of infection by mild cases,
- the early infectivity of the patient and
- the extremely short incubation period (about 48 hours).

It is this last circumstance which conditions the rapid, almost explosive, spread of influenza. On a purely mathematical basis its rate of spread must be about 64 times as rapid as that of smallpox, of which the incubation period is 12 days.

Prophylactic vaccination has had an unequalled opportunity afforded it to prove its value. More than half the population of Sydney and suburbs had been vaccinated prior to the invasion. The case for prophylactic vaccination is under examination by a specially appointed body and accordingly it would be wise to observe the legal practice and refrain from comment upon a cause which is *sub judice*. More light appears to be required upon the subject before any further vaccination campaign is inaugurated.

The wearing of suitable masks over the mouth and nose seems to me to be a most valuable precaution; the difficulty is to enforce it just where it is most necessary, *i.e.*, in the households of those attacked by infectious colds and in work places. In crowded trams and trains the practice probably has a high value. It has been quite a common thing to hear of a person who was suffering from a mild attack of influenza, travelling by tram or train to consult a doctor or obtain medicine at a chemist's, and many persons who are taken ill suddenly when at the place of their employment, leave their work and travel to their home by one or other forms of public conveyance.

The failure of the mask to protect some of the medical officers and nurses in influenza hospitals is due to special conditions. In a hospital where the air is relatively stagnant and the amount of fine infective particles constantly being given off by the patients is enormous, the whole atmosphere near the bed level must be a sort of fog of infection in which the nurse moves. Any failure of accurate adjustment of the mask to the face of the nurse permits access of the infective, floating particles to the mouth and nose and may lead to infection. In circumstances where the infection is less concentrated, the mask is a more certain protection and against the droplets of infective saliva and mucus expelled forcibly from the mouth of a sufferer toward the mouth of the healthy, the interposition of a mask of gauze must be a very reliable safeguard.

The wearing of masks in the open streets seems to have little to recommend it and one cannot help thinking that a mistake was made in enforcing this precaution upon the public at the beginning of the epidemic.

Of the wisdom of the restriction of public assemblies in Sydney at the present time there can scarcely be two opinions. This measure can only be applauded.

The possibilities of the transference of infection in such crowded places of amusement as picture shows and theatres must be considerable. It is idle to contend that sick persons do not attend such places. I have personally come across two instances in which persons suffering from very mild attacks with temperatures from 37.8° to 39.8° C. have attended pic-

ture shows and I have no doubt such an occurrence is not uncommon.

Much capital has been made throughout the course of this epidemic by the use of inhalatoria or spray rooms in which persons who are specially exposed to infection, are subjected to the inhalation of a finely atomized spray of sulphate of zinc solution. These spray rooms have been a good deal used by the army in Europe and on troopships returning to Australia, and some medical officers in the Australian Army Medical Corps have been very favourably impressed by the results of this prophylactic treatment. It is difficult to understand that it can have very great value in influenza. It appears to have been employed largely on account of a reputation acquired in treating "carriers" of cerebro-spinal meningitis. The theory underlying the procedure is entirely different in the two conditions, and the results of the treatment must be very transient and cannot be expected to relieve infection of any individual in whom the infective material has travelled beyond the surface of the mucous membrane of the naso-pharynx. Under the best conditions, therefore, its usefulness would be limited to the treatment by it of persons (medical men, for instance) who have just been exposed to a definite risk of infection. Probably the inhalation treatment has a psychological value which, perhaps, should not be overlooked.

One is reluctantly forced to the opinion that no conceivable public health measures are likely to arrest the spread of the epidemic in Sydney. But the restrictions now enforced upon the public are probably delaying the rapidity of its progress sufficiently to prevent the swamping of the hospitals and so ensure proper treatment for the great majority of those who suffer severe attacks and therefore they must by no means be foregone.

During the past three days there has been a slight easing of the situation as regards the epidemic, which may be significant. Rather fewer cases are being reported, and in the more congested parts of the city and central suburbs at least, the demands upon the Health Department for conveyance to hospital and upon the relief depôts for assistance have been less urgent. This may merely be the manifestation of a trough in the epidemic wave, or it may be a definite improvement, possibly due to the operation of the masking and other restrictions imposed upon the public a week earlier. It is too soon to form a judgement upon the question yet. It is, however, significant that the improvement has occurred at about the time it might have been expected, had it in truth been conditioned by the operation of the restrictions in question.

SOME ÆTIOLOGICAL AND PATHOLOGICAL ASPECTS OF THE INFLUENZA OUTBREAK.¹

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A summary of this paper is published on another page of this issue in connexion with the discussion.

¹ Read at a Meeting of the New South Wales Branch of the British Medical Association on April 11, 1919.

SOME CLINICAL OBSERVATIONS ON CASES OF INFLUENZA IN THE PRESENT EPIDEMIC.¹

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(Prepared at the express wish and published by the courtesy of the Acting Medical Superintendent, Donald Wallace, M.A., M.B., Ch.M.)

This paper is not intended to give a systematic account of the disease, but merely to record a few clinical observations made at the Coast Hospital.

Incubation Period.

This is generally two days.

Symptoms.

1. Headache is usually severe, sometimes it is generalized, but most commonly frontal, more rarely temporal. It is very often accompanied by a dull retro-ocular pain, made worse by pressure on the eye-balls. In many cases pain is caused by movements of the eyes and may be so severe that patients prefer to turn the whole head rather than their eyes in looking to one side. Headache is aggravated by bending the head downwards. Transient diplopia has been noted in several cases.

2. Pain.—(a) Backache referred to the lumbo-sacral region is very common. It may also be referred to the dorsal region, to the region of the scapulae or to the back of the neck, or may be experienced in all these regions conjointly. The ache in the back of the neck is often complained of as headache, but is really muscular in origin.

(b) Pain in the limbs is almost invariably referred to the posterior aspect of the lower limbs including the gluteal region. Pain in the arms is frequently present but not usually complained of, as it is overshadowed by the more severe pains in the lower limbs. These pains are aggravated by movement and pressure. The pain on moving the eyes, referred to above, is probably similar in causation.

(c) Abdominal pain will be referred to under gastro-intestinal symptoms.

3. Weakness.—A large number of patients complain that they have been suddenly taken ill with feelings of great weakness, both mental and physical. In some cases the patient is so overcome by this feeling of weakness that he may fall down.

4. Shivering.—Shivering or even a slight rigor may usher in an attack and may occasionally be repeated. A patient often complains of a sensation of "cold up and down the spine."

5. Sweating.—This is frequent at the onset and during the course of the disease and may be copious.

6. Cough.—Cough usually occurs early, but may be delayed for one or two days or, in rare instances, it may be absent. The cough is at first dry, harsh and irritable, giving the impression that the patient is

¹ Read at a Meeting of the New South Wales Branch of the British Medical Association on April 11, 1919.

continually clearing the throat. Later on this becomes more pronounced, more frequent, generally difficult and hacking, and accompanied by a little glairy sputum, finally becoming purulent.

7. *Coryza*.—*Coryza* is comparatively frequent. The upper eyelids appear heavy and drooping, while the conjunctiva presents a similar picture to that seen in measles, only to a far less degree. The face is often flushed.

8. *Epistaxis*.—This has been relatively infrequent but may be severe. One case required plugging.

9. *Tongue*.—On the first day the tongue is large and flabby, often tremulous and indented by the teeth, giving the impression of macroglossia. It is covered by a thin, white fur. In the more severe cases the tongue rapidly becomes coated with a thick, creamy-yellow fur through which the papillae at the margin are often visible. As the case progresses:—

(a) favourably, the epithelium is gradually shed, showing up the papillae more definitely and presenting an appearance very similar to scarlet fever tongue;

(b) unfavourably, it becomes dry, sometimes very rapidly and may become the fissured tongue as seen in the typhoid state. Complications may occur in rare instances although the tongue remains moist and thinly coated or even comparatively clean.

(c) A peculiar tongue of the beefy type is seen that may persist without a coating.

10. *Sore Throat*.—The fauces, tonsils and soft palate are almost invariably congested. In the more severe cases the buccal mucous membrane may also be involved. The intensity of the inflammation is no index to the patient's sensation. Children complain more of sore throat than adults.

11. *Pharyngitis*.—The pharynx almost invariably shows a granular inflammation, which may persist through convalescence.

12. *Laryngitis*.—This is not uncommon, varying in degree from tickling and slight hoarseness to absolute aphonia and may, in rare instances, cause dysphagia.

13. *Tracheitis*.—This is very common. Patients will complain of a feeling of pain or rawness and tightness across the chest, which may give a sense of suffocation.

14. *Lungs*.—In the mildest cases the lungs may be quite clear. From this they may vary through all stages up to a generalized broncho-pneumonia. Large areas of lung may give classical signs of consolidation, this being caused by the running together and spreading of the broncho-pneumonic patches. The earliest abnormal sign is a harsh respiratory murmur which precedes the sticky, glutinous crepitations at the bases of the lungs, more frequently at the base of the left, which are very characteristic of influenza. Sometimes the consolidation starts at the extreme base and spreads up so as to involve the whole of the posterior surface of the lung in a short time. The intensity of the inflammation may be such that hæmorrhages, sometimes of large amount, occur. At other times patches showing classical signs of consolidation appear in various regions of the chest, giving the impression of a broncho-pneumonic patch which has spread sufficiently to be recognizable. Frank consolidation is very often heralded by flatness to percussion, dimin-

ished air entry and showers of fine crepitations at the end of inspiration. Bronchial breathing is often heard between the scapulae, and is due to enlarged mediastinal glands. This has been verified *post mortem*.

The sputum in the early stages is generally absent, but with the increase of cough, glutinous, mucopurulent sputum appears which is dislodged and expectorated with great difficulty. If the inflammatory process remains confined to the bronchi, the sputum of the later stages is purulent, sometimes nummular and copious. With the onset of pneumonia blood appears, either bright and fresh, as in most cases, or rusty. The intensity of the inflammation, as stated above, may be such that hæmorrhages, sometimes in large amount, occur. In cases which have an unfavourable termination, the sputum becomes scanty and very sticky. Sometimes, in the early stages of pneumonia, a large quantity of pinkish, frothy sputum is expectorated.

15. *Gastro-Intestinal Symptoms*.—(a). Vomiting is fairly frequent; most often it is due to the strain of coughing, but at other times definitely associated with nausea.

(b) Diarrhœa is met with but not frequently. It may be so severe as to overshadow all other symptoms giving rise to what may be called a gastro-intestinal type of this disease. These cases, which are infrequent, are associated with abdominal distension, enlargement of the spleen and profound depression, so that the clinical picture is an exact counterpart of that in the third week of enteric fever. Bacteriological examinations of the blood, faeces and urine were negative and in three cases the Widal agglutination test against *B. typhosus* and *B. paratyphosus* A and B were negative also.

(c) Constipation is very much more frequent than diarrhœa. In both diarrhœa and constipation there may be severe colic.

(d) Anorexia is a very prominent symptom. Loss of taste occurs early in the majority of cases and may persist into convalescence. Perversion of taste may occur early and may persist into convalescence also.

(e) In several cases there has been rectal hæmorrhage, sometimes in large quantities up to a quarter of a litre. In one case hæmorrhage occurred in early convalescence.

(f) The spleen is seldom palpable.

16. *Genito-Urinary*.—In the female the onset of the disease very often coincided with the beginning of a normal menstrual period. If a normal menstrual period were not due, premature menstruation very often occurred, being from ten to fourteen days ahead of the normal time. In the majority of these cases there was menorrhagia or dysmenorrhœa. It is interesting to note that all these conditions have been seen after prophylactic inoculation. Polyuria has been noted at the onset of the disease in a few cases.

17. *Nervous Symptoms*.—The following may be mentioned:—

- (a) Apathy.
- (b) Mental confusion.
- (c) Lack of concentration.
- (d) Dizziness.
- (e) Herpes.

(f) Delirium is a constant accompaniment of the more severe cases. It may be divided into two classes, (i.) active maniacal delirium, (ii.) low muttering delirium—typhoid state. Deafness very often occurs in varying degrees. Loss of smell and taste has already been mentioned.

18. *Cardio-Vascular Symptoms*.—At the onset and during the course of the disease the arterial tension is invariably low. This persists during the course of the disease and convalescence. A dicrotic pulse is more frequent than in typhoid fever. At the onset the pulse-rate is increased in proportion to the temperature but almost immediately is slowed down disproportionately, so that a temperature of 38.8°C . may be accompanied by a pulse of 80. Towards the end of illness the pulse-rate may fall as low as 40 per minute or even lower. This slow pulse has been of good omen.

Colour.—In moderate and severe cases there is an early, slight inclination towards duskiness of the face. With the onset of pneumonia the colour becomes lilac which, with the steady extension of pneumonia, gradually deepens into definite cyanosis. Sometimes just before death the face may become ashy.

19. *Skin*.—In convalescence desquamation of the hands and forearms is common, starting as a pinhole. Falling of hair is common and well marked. Petechiae have been noted in two cases on the upper and outer quadrants of the breasts. Petechiae have also been noted in cases of jaundice which itself is not common. Furunculosis has been met with in a few cases in convalescence.

20. *Joints*.—Joint pains are not uncommon. Very rarely has there been effusion. The effusion may be purulent.

Further Complications.

A certain number of complications have for convenience sake been included under the heading of symptoms. The following remain to be considered:—

1. *Empyema*.—This has been relatively infrequent, occurring in only two of our cases.

2. *Parotitis*.—This has not been as frequent as one might have expected from the filthy state into which the mouth is apt to get in severe cases. In each case it has subsided without incision.

3. *Albuminuria*.—Albuminuria is fairly common sometimes in large quantities up to a half. When in large quantities there are frequently large numbers of granular casts. The condition invariably clears up rapidly.

4. *Relapse*.—Two distinct types of relapse may be distinguished.

(a) True relapse.

(b) Intercurrent relapse.

The temperature after relapse almost invariably falls by lysis, a method of defervescence which is uncommon after the primary attack. Relapses may occur after the temperature has fallen, either by crisis or by lysis. Several cases have occurred in which the intercurrent relapse is repeated. The course of the relapse is generally milder than the primary attack, but may be more severe, even fatal, and in such relapses pneumonia may appear for the first time.

5. In our experience active pulmonary tuberculosis has not been much affected. We have, however, seen latent cases activated.

Types of the Disease.

1. *Apyretic*.—Here all the signs, symptoms and after effects of an uncomplicated attack are reproduced with the fever. These are comparatively frequent.

2. *Abortive Type*.—In these cases the temperature is raised merely for a day or two, and there is a typical picture of the disease.

3. *Mild to Moderate*.—The majority of cases conform to this group. Here we include the uncomplicated types of influenza, the usual course of which runs from five to seven days, generally ending by crisis. At the end of the disease there is a predominating sense of well-being, in spite of the weakness which still persists.

4. *Severe Cases*.—The cases in this category invariably have pneumonia and although at first were practically non-existent, they are now rapidly on the increase. In alcoholic and emphysematous subjects the disease is apt to go badly. This may be a reason for the greater fatality of the disease amongst males.

Treatment.

Since influenza is a self-limited disease and subject to sudden changes, both favourable and unfavourable, it is very difficult to estimate the value of any given treatment.

A. *Specific*.—(1) Serum.

(i.) Immune human serum.—Intra-muscular injections of defibrinated blood from persons convalescent from pneumonia have been tried in three cases with encouraging results.

(ii.) Immune horse serum.—Anti-streptococcal and anti-pneumococcal serum has been extensively used. The quantities given were 10 c.cm. of the former and 20 c.cm. of the latter, the doses being repeated daily as often as four or five times.

It has appeared to us that in some cases this method of treatment has done good. The serum was prepared by immunizing horses against strains of streptococci and pneumococci, isolated from cases occurring in the influenza epidemic in America.

(2) Vaccine.—Vaccine has been extensively used with and without calcium lactate.

(i.) A sensitized vaccine containing equal quantities of *B. influenza*, *Staph. aureus* and *albus*, *Streptococcus*, *Pneumococcus*, *B. friedländer* and *M. catarrhalis* has been most often employed, the usual dose being 100 millions of each for adult males and 50 millions of each for adult females.

(ii. and iii.) The quarantine formula and that of the Board of Health have also been used. Results so far are inconclusive.

B. *Symptomatic*.—

(i.) Pains.—Aspirin (0.4 gm.) and caffeine citrate (0.18 gm.) have been extensively used. This has effectively controlled the pains which are sometimes excruciating.

In some cases aspirin appeared to have a dangerously depressing effect on the vaso-motor apparatus.

Sodium salicylate and salicin have been much used for this purpose and have been of value; the dose given was 0.9 gm. every four hours.

Pulv. ipecac. co. (0.6 grm.) in the less severe cases frequently gives a night's rest with sweating, so that the patient awakes refreshed and improved; it also relieves the pains.

Hot water bags and counter-irritation, such as mustard leaves and mustard poultices, also give relief.

(ii.) Cough.—Two different lines of treatment have been used, one stimulating, the other sedative. While neither of these has appeared to influence the condition of the lung, the sedative treatment gives much comfort to the patient.

Inhalations containing menthol, the compound tincture of benzoin, eucalyptus and camphor have given great relief, more particularly when the upper respiratory part is most effected.

Counter-irritants, such as iodine and mustard leaves, applied over the sternum and root of neck, have given relief for the unpleasant sensation of rawness and tightness across the chest, which may be very distressing in cases with tracheitis.

A spray of 2% chloretone in paraffin oil has given much relief for hacking ineffectual cough.

Heroin (0.005 grm.) has been extensively used by one of us and has been found very effectual in controlling the cough and has been without ill effects.

C. Stimulants.—Strychnine, caffeine, a solution of camphor in ether and olive oil, digitalis preparations and atropine have been much used hypodermically with good effect. Brandy has been proved of very little value and its use has been largely discontinued.

D. Rectal Saline Solution.—The influenza patient suffers considerably from thirst, so that it has been the practice to leave a large vessel of water at the patient's bedside and to encourage him to drink freely. In toxemia cases where this is inadequate, rectal injections of saline solution meet an urgent indication and have, in our experience, done great good.

Convalescence.

Tonics in convalescence have been of value, those containing quinine have been most useful.

Reports of Cases.

HYDATID DISEASE OF THE VERTEBRÆ.

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Senior Surgeon, Renwick Hospital for
Infants, Sydney.

A.J., *et.* 28 years, a farm labourer, from Delegate, in the Monaro district, was admitted into Sydney Hospital on April 25, 1915, and discharged on April 9, 1916.

History.—Two months ago, while driving sheep, he got a pain in the left hip, which went down the thigh and was shooting and sharp in character. The pain was continuous for about a fortnight, when it extended to the other side and to the small of the back. About one month ago control over both extremities was lost, and the limbs slowly became numb. He then went into Bega Hospital and was treated for rheumatism, but did not improve under treatment. He had control of the bladder till four days ago; since then he

has had to be catheterized regularly. There is no history of venereal disease.

Present Condition.—He sits up in bed with the head bent forward, complaining of great pain in the back. He is not cachectic looking and is fairly well nourished. There is complete loss of power in both lower limbs from the hips downwards. The muscles are flaccid and quite



FIGURE I.
Primary Hydatid (Shaded) on
Lumbar Vertebra II..

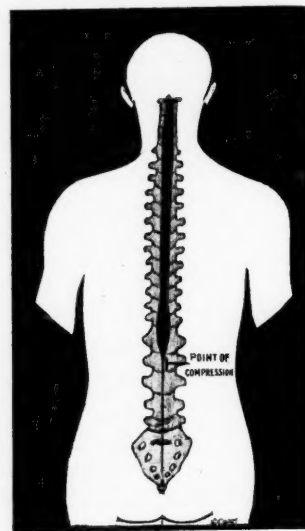


FIGURE II.
Diagram Showing Outline of Spinal Cord
in the Spinal Canal.

toneless and all reflexes are absent, except the cremasteric, which is present on both sides and well marked. There is no control over bladder or rectum. Sensation is very little affected, except in the area supplied by the first sacral nerves, where sensation to light touch is very imperfect. He is unable to distinguish between heat and cold. There is no projection of the spine, but in the lumbar region is an ill-defined area of tenderness. There is a small bed sore over the sacrum.

Electrical Reactions.

—All the muscles except the *quadratus femoris* and the *tibialis anticus* (right) failed to react to any form of stimulation—faradic or galvanic. The two muscles named reacted but slightly.

The blood on examination on April 29, 1915, was normal. There was no eosinophilia. The Wassermann test was negative.

An X-ray examination on May 8, 1915, revealed no bony abnormality.

On June 8 the patient was operated upon under ether anaesthesia. The steps of operation and the nature and site of the lesion are depicted in Figures I.—X. Figure XI shows the skin incision. A drainage tube was inserted into the cavity left by the removal of the hydatid cysts from the spine

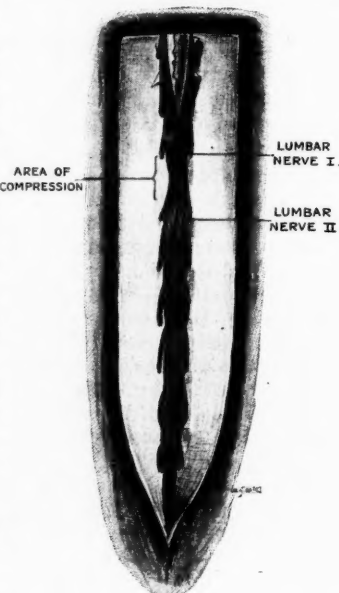


FIGURE III.

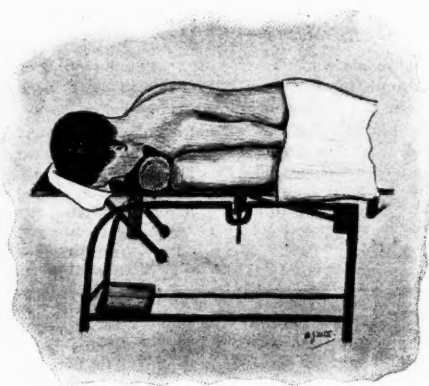


FIGURE IV.
Body in Position for Anæsthetic and Operation.

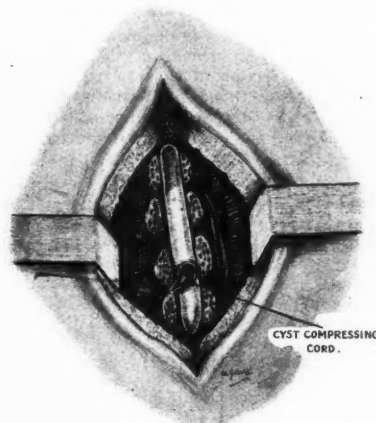


FIGURE VII.
Showing Arches (Sawn Off) of Dorsal Vertebra XII.,
Lumbar I., II., III.

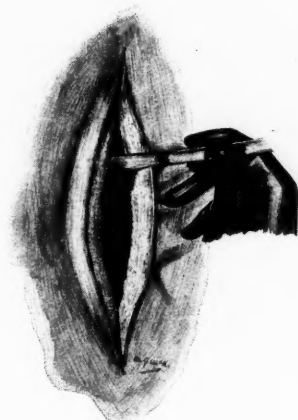


FIGURE V.
Skin Incision.

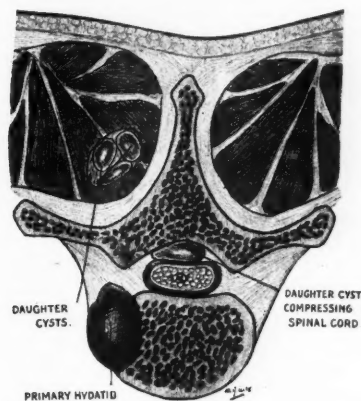


FIGURE VIII.
Diagram of Transverse Section of Lumbar Vertebra II., showing primary focus and daughter cysts in lumbar muscles and one having migrated into spinal cord.

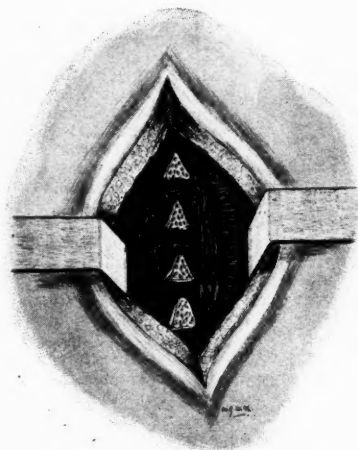


FIGURE VI.
Showing Spines of Dorsal Vertebra XII., Lumbar I., II., III. Sawn Off and Muscles Retracted.

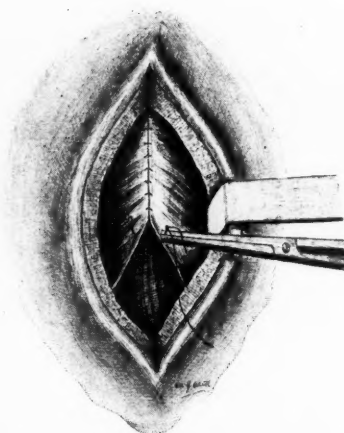


FIGURE IX.
Suturing of Muscles and Fascia.

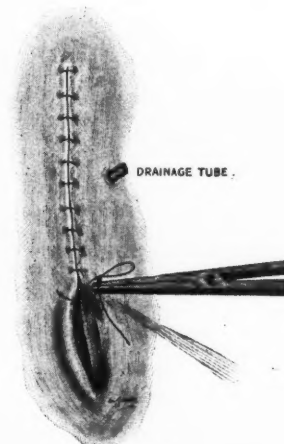


FIGURE X.
Suturing of Skin.

erector muscles and taken away at the end of twenty-four hours. The main incision healed by first intention.

From June 10, 1915, onwards the bladder repeatedly emptied itself automatically. Movement of the limbs gradually returned, first slight flexion of the hip, then flexion and then extension of the knee, then, on October 6, 1915, ankle clonus, marked on the right side, but occasionally only on the left side. The power of moving the toes returned on September 29, but a little before this one could elicit a plantar flexor reflex. On October 26 control of the bowels returned and that of the bladder on November 23, 1915.

The electrical reactions gradually returned to normal. The knee-jerks were first noted eight months after the operation.

Condition on Discharge.—April 9, 1916: The patient was able to get about with crutches and had recovered complete control over the bladder and rectum. When lying on his back he could raise each leg off the couch with the knee extended. Both feet were kept extended, with the toes flexed, and tended to be swollen and cold. He could stand on his feet with the help of crutches, but there was some difficulty in flexing the ankle joint properly. The knee-jerks were exaggerated, with well marked ankle clonus on both sides. The plantar reflex was still flexor.

On September 30, 1918, three years and three months after the operation (*vide* Figures XII. and XIII.), he came to Sydney and was examined by both of us, when it was noted that he could walk about a hundred yards without crutches, could raise each leg off the couch in the extended position and flex it as much as he pleased. Both legs were rigid, but the rigidity could easily be overcome.

Reflexes.—The organic reflexes were perfectly normal. The plantar reflex was flexor in each foot and the knee-jerks were exaggerated. Ankle and patellar clonus were well marked.

Remarks.

Although it is well known that primary hydatid disease occasionally may occur in the spinal column, as in other bones, yet very few successful cases are on record. The reason for this apparently is that the disease is too extensive for operation by the time the condition is diagnosed. This case fortunately came under observation within two months of the onset of symptoms, though the operation was delayed for a month for fear of sepsis from a bed-sore over the sacrum present on admission.

We should like to discuss the case from two points of

view; firstly, the diagnosis and localization, and, secondly, the return of muscular power and reflexes after operation.

I. Diagnosis and Localization.—The lesion was located in the second lumbar vertebra, because both second lumbar roots and all the other motor roots below these were completely paralysed. The presence of the cremasteric reflex showed that the first lumbar nerves were unharmed. The nature of the paralysis (flaccid), with the total absence of all the reflexes below the cremasteric suggested an infranuclear lesions—in this case a lesion of the *cauda equina*. This diagnosis was clinched by the almost complete absence of any electrical reaction in the paralysed muscles. This all

pointed to a lesion of the whole *cauda equina*, which could only be opposite the body of the second lumbar vertebra. The diagnosis of hydatid was merely a probability. The spine was obviously the seat of disease, as it was held rigid and constant pain was present. There was no cachexia. The patient was a ruddy-cheeked countryman. There was no projection of the spine. All this was against tuberculosis. Such signs and symptoms caused by a new growth were out of the question, and as he came from a hydatid-infected district and we had other data (no history of syphilis, a negative Wassermann response and a negative X-ray result) we came to the conclusion that hydatids were causing the trouble.

II. Return of Muscular Power and Reflexes.—Sensation returned to normal within a week of the operation, which is in accordance with common experience. The rigidity of the legs, with exaggerated knee-jerks and ankle clonus, resembles what one would expect from a lesion compressing the spinal cord rather

than the *cauda equina*. A lesion of the *cauda equina*, one would have thought, would behave like a lesion of a peripheral nerve; that is, as the nerves recovered their power of transmitting impulses, the muscles would recover the power of contraction without any rigidity or abnormal condition of the reflexes. We must suppose that the lumbar region of the spinal cord suffered from the increased intra-spinal pressure, the substance of the cord being more sensitive to pressure than the stouter peripheral nerves of the *cauda equina*.

It is outside the scope of this paper to discuss the origin of the reflexes, including patellar and ankle clonus. We merely wish to put on record what happened in this particular case.

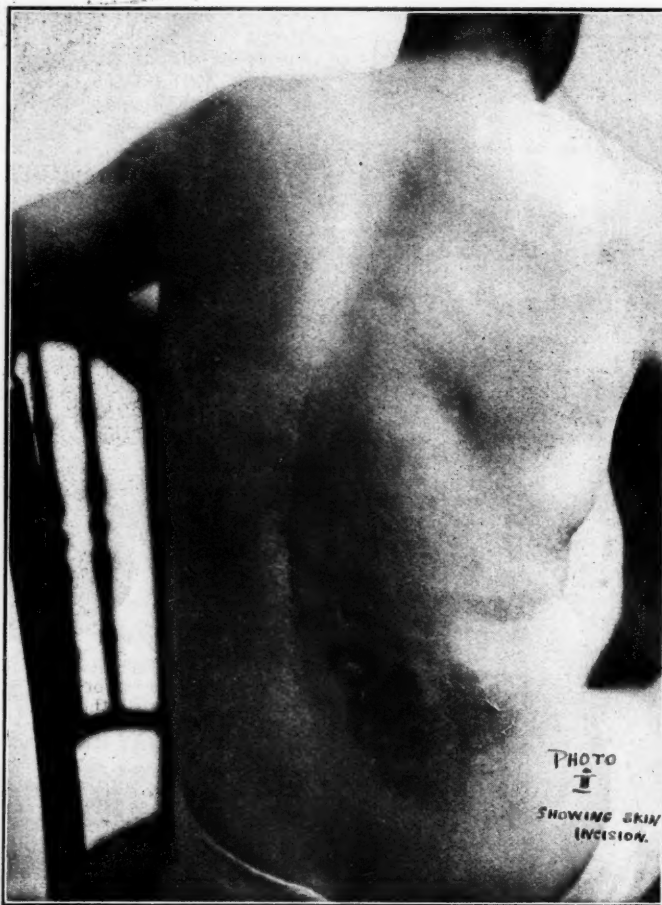


FIGURE XI.



FIGURE XII.

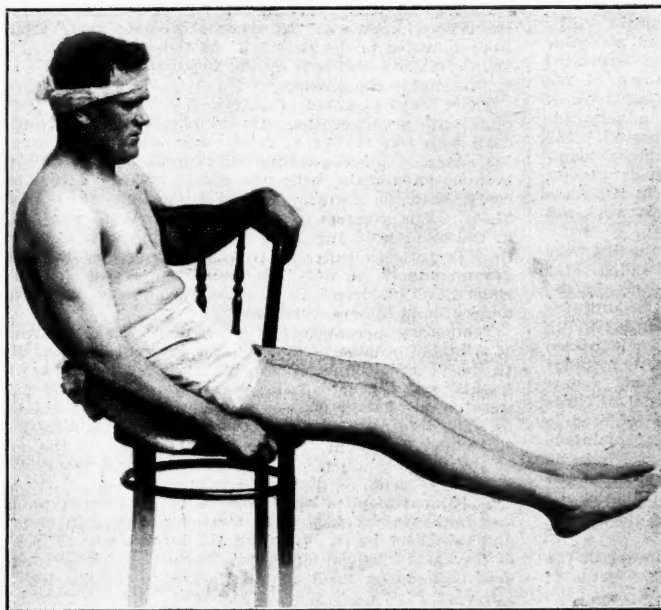


FIGURE XIII.

Reviews.

DIABETES.

Elliott P. Joslin has issued a short manual on diabetes of some 180 pages¹ in order to carry out his often expressed view that the diabetic patient cannot know too much about his disease and to assist doctor and patient in collaborating the treatment in such a manner as to obtain the greatest possible success. The book is very simply written and very easily understood and should be in the hands of every medical man and of many patients.

Much of the matter is necessarily taken from his larger "Treatment of Diabetes Mellitus," but it is presented in a more elementary, yet thoroughly scientific, fashion. It is in four parts. Part I. may be called a diabetic primer, giving in non-technical language and partly in the form of a letter to a school girl the fundamental conceptions of the disease and its arithmetic, and a series of questions and answers for diabetic patients.

Part II. gives details of diabetic treatment, both as to mild and severe cases, discusses the composition of foods and their caloric values and gives the author's well-known views on the management of acid intoxication and coma, with short chapters on "care of the teeth" and "skin," "constipation" and "drugs in treatment of the disease."

Part III. is taken up with diabetic suggestions, recipes and menus and gives numerous diet tables. It will be found of extreme value to the practitioner and patient alike.

Part IV. gives selected laboratory tests of urine, blood and expired air and the examination of the CO_2 , which has proved of so great value in detecting the threatened onset of acid poisoning.

We know of no book which can be so recommended as this one to all who have the handling of this class of case, and not the least of its advantages is its brevity and the convenient size and clearness of printing, which makes for easy study.

MILITARY SURGERY.

"Surgery at a Casualty Clearing Station," by Cuthbert Wallace and John Fraser² will attract much attention for several reasons. These include the reputation of its authors and the prominent part casualty clearing stations have played in the war. Wallace, as Surgical Consultant to the First British Army, had excellent opportunities, and of these he has made full use. The reader finishes a perusal of the book with a pang of regret that the methods of treatment employed in the later stages of the war and arrived at by bitter experience, were not available earlier, to the saving of much life and mutilation. However, campaigns in Flanders mud are not of frequent occurrence; hence our experience had to be bought and sought dearly. We will be better prepared for the next war.

After dealing with surgical shock, on which there has been much research during the war, the authors proceed to discuss general wounds and their treatment. The variety of infecting organisms, largely anaerobic, are enumerated. It was in the frequency of this anaerobic infection that war wounds differed so much from those in civilian life. With regard to treatment, there are full descriptions of the methods usually employed at the front, viz., (1) primary suture after excision of the track, (2) primary excision and suture with the addition of a depot antiseptic, such as B.I.P.P.; (3) excision of the track with dependent drainage; (4) Wright's hypertonic salt treatment; (5) intermittent irrigation after the method of Carrel. They consider the first two methods unquestionably the best.

¹ A Diabetic Manual for the Mutual Use of Doctor and Patient, by Elliott P. Joslin, M.D.; 1918. Philadelphia and New York: Lea & Febiger; Demy 8vo., pp. 187, illustrated. Price, \$1.75.

² Surgery at a Casualty Clearing Station, by Cuthbert Wallace, C.M.G., F.R.C.S., and John Fraser, M.C., F.R.C.S.E.; 1918. London: A. & C. Black, Limited; Crown 8vo., pp. 320. Price, 10s. 6d. net.

About 50% of wounds were being treated on these lines; but it must be understood that this applies to wounds as seen at a casualty clearing station, where patients are received from two to twenty-four hours after having been wounded. In the presence of inflammatory complications, excision and primary suture is not safe.

In evolving the best form of treatment, much useful work has been done on antiseptics, and a better realization of their value and limitations has been arrived at; yet in Sydney, in the presence of epidemic influenza, the water from the municipal street sprinkler is still coloured with one of the phenol group of disinfectants; what its strength and antiseptic value is would be interesting to know.

There is a most interesting section on gunshot injuries of bones. The Thomas straight splints are found to be best near the front line, the angled splints being more cumbersome and more difficult of transport. Colonel Sir Robert Jones and Major Sinclair are largely quoted. To them is due much of the success in the treatment of gunshot fractures.

In abdominal wounds the surgeon in a casualty clearing station has opportunities denied to other medical units; consequently, a book of this nature gives the result of much experience. One of their conclusions is that, with certain exceptions, multiple suture is preferable to resection, the main reason being the difference in the amount of shock. If resection is performed they prefer lateral to end-to-end.

Chest wounds are dealt with extensively, since surgery has advanced much in the treatment of these wounds during the war. Foreign bodies are now removed quite frequently from the lung. Here again judgement is required to recognize the limits to which one should go. Some of the bacteriology of chest effusions was done on patients in Australian clearing stations through the co-operation of the surgeons and the bacteriologist in the depot behind the line. They are therefore of special interest to Australians.

Anaerobic infections, as in wounds of the limbs, are the bugbear of the surgeon, as muscle and effused blood are the especial habitat of these germs.

Head injuries, amputations, transfusions, infusions and tetanus are all dealt with in a practical and scientific manner.

The book will well repay reading by surgeons of all grades.

Hospitals.

BROKEN HILL AND DISTRICT HOSPITAL.

The annual report of the Broken Hill and District Hospital for the year 1918, together with the Surgeon-Superintendent's report, has been published in pamphlet form. The following is a summary of the most important chapters.

Extension and Improvement to the Hospital.

The outside of the Hospital has been re-painted with zinc oxide paint. The zinc oxide was a gift of the Associated Smelters Proprietary, Limited, while the members of the Painters' Union undertook the work of painting free of charge. It appears to us that this represents a very important attitude of the public toward a large hospital. The principles involved include the selection of a harmless chemical substance in the place of the more usual, but dangerous, lead oxide. In the next place, the people of Broken Hill have demonstrated that a gift of value and gratuitous work are in place in connexion with a charitable institution.

During the course of the year a few urgent repairs were carried out and some necessary equipment installed. Dr. Birks, the Surgeon-Superintendent, submitted early in the year a scheme for more extensive modifications and improvements which would be required to bring the institution up to date. The principal items of the scheme are an increased water storage, a complete drainage and septic tank installation, additional accommodation for the nursing staff, a new medical ward for women, a maternity ward, a venereal clinic and a receiving ward. The capital expenditure required is estimated at £15,000, while the additional cost of maintenance would be approximately £5,000 per annum. The scheme has been accepted by the Board, but it is recognized that the funds are not immediately available for carrying it into effect.

Co-operation Between the Hospital and the Municipal Council.

The Board of the Hospital has made the proposal to the Municipal Council of Broken Hill to render the resources of

the Bacteriological Laboratory available to the Public Health Department of the city. No final arrangement had been made.

Medical Staff.

During the year 1918 the Surgeon-Superintendent, Dr. Birks, has carried out his heavy duties to the complete satisfaction of the Board, with the able assistance of Dr. Burnell. In ordinary times the medical staff of the Hospital was composed of three members. The demands of the military authority rendered it impossible for the Board to engage the services of a third practitioner and, during the greater part of the year, they were compelled to allow medical students from the Adelaide University to give assistance to the staff.

Financial.

The total expenditure for the year amounted to £18,690. Of this sum the Government provided just under one-half, while the Workers' Contribution Fund was responsible for £5,676 and the patients for £1,403. Subscriptions, donations and the proceeds of entertainments raised the amount by £2,308. At the beginning of the year the Board had a balance in hand of £117, while at the end of the year this amount had increased to £721. From October 10 a general increase in pay was granted to the staff to meet the increased cost of living. The Hospital employees were thus brought into line with the other workers in the district.

Hospital Statistics.

The Surgeon-Superintendent, Dr. Birks, reports that, in addition to the 83 patients in the Hospital on the first day of the year, 1,391 were admitted, while on the last day of the year there were 88 still under treatment. The total number of patients discharged was 1,210, while 176 patients died. The mortality for the year works out at 12.69%. The average length of residence of the patients who were discharged was 26.08 days and of those who died 15.42 days. The average number of patients in the Hospital at any given time was 106.13. No less than 357 children of twelve years or less were treated during the year in the Hospital. The total number of patients attending at the out-patient department was 1,727, including 624 who had met with accidents.

An outbreak of diphtheria caused the Board considerable concern. The number of patients admitted for this condition was 202, of whom 12 died, which yields a case mortality of 6%. A bacteriological examination of the faecal mucus of all infected persons and of those who had been in contact with them was carried out in the district and had the effect of checking the spread of the infection. The control of the throat was extended to school children, no less than 2,673 being examined. Among them 23 diphtheria bacillus carriers were discovered. These carriers were isolated and subjected to treatment.

During the early part of the year a further outbreak of the disease known as "X" disease occurred and 24 patients were admitted to the Hospital. Of these 24 patients, 21 died. Dr. D. Wallace was sent by the Department of Public Health to investigate the disease.

There were 31 cases of enteric fever treated in the Hospital, with seven deaths. The number of cases of influenza dealt with was 41, but no deaths were recorded. There were 139 cases of lobar pneumonia, with 39 deaths, and six of broncho-pneumonia, with one death, making a total of 145 cases, with 40 deaths. The case mortality was therefore 27.58%. The greatest frequency of pneumonia was met with in the months of July, August, September and October. Of the 139 patients suffering from pneumonia, 45 were underground miners, 30 were other mine employees and 44 were women and children. The mortality was heaviest among the underground miners, being 44.4%.

Temporary arrangements were made for the treatment of a limited number of males suffering from venereal disease. In the venereal clinic 47 patients were treated between July 1, 1918, and the end of the year. Eleven of these patients were cured of their disease, a similar number absconded before the treatment was complete and the remaining 25 were still under treatment at the end of the year. In the account of the work conducted in the bacteriological laboratory, no mention is made of the Wassermann reaction.

The Department of Public Health supplied anti-typhoid and anti-influenza vaccines. The former was used in 13 persons and the latter in 78. Dr. Glen H. Burnell, who is in charge of the bacteriological laboratory, carried out no less than 220 examinations for medical practitioners in the district.

The Medical Journal of Australia.

SATURDAY, APRIL 26, 1919.

Seeking For Light.

In the present issue we publish a summary of a debate which took place recently at a meeting of the New South Wales Branch of the British Medical Association on the epidemic of influenza. The opinions of the several speakers will be read with interest and not a little anticipation. Following as it does on a similar debate in Victoria, it serves to enable members to gauge the extent of our knowledge of the epidemic as it is affecting Australia. One fact emerges from both discussions, namely, that, while the clinical manifestations and gross pathological changes have been accurately and minutely recorded, very little is known concerning the aetiology and pathogenesis of the disease. Dr. W. G. Armstrong is to be congratulated on the lucid manner in which he imparted the information and on the scientific spirit in which he approached a most difficult aspect of the problem. The epidemiology of a disease of unknown aetiology must of necessity be incomplete and the chain of data must be broken in many places. Dr. Armstrong has wisely avoided the impossible task of presenting a continuous story, for this could only be effected by filling the defects in the account by insinuating speculative argument in the place of a record of observed facts. In other countries a considerable amount of work has been conducted in the laboratory and in the post-mortem room in the search for the truth concerning the causation of the disease and the mode of its spread. By almost universal consent, the view that the primary agent in the causation is unknown has replaced the belief that the bacillus of Pfeiffer represented the virus. The experiments of Nicolle and Lebaillly do not yield evidence as strong as was adduced in 1892 by Pfeiffer in favour of his bacillus, and yet it is held that Pfeiffer's evidence was insufficient. The information obtained in Australia and other parts of the world concerning the frequency and nature of bacteria acting as secondary invaders is important and has an undoubted practical significance, but this know-

ledge does not compensate for our ignorance of the primary cause. Until we know what this cause is, we cannot expect to advance beyond the stage of groping in the dark. With an abundance of material and an extraordinary concentration of energy on the part of the medical profession in the endeavour to gain a mastery over the disease, the possibility of overcoming the first and most essential difficulty is not to be denied. It remains with the bacteriologists in the Commonwealth to endeavour to solve a problem which, so far, has baffled workers in other parts of the world.

Dr. Armstrong reviews some of the measures that have been adopted in the hope of stemming the tide of the disease. He mentions in the place of honour the expedient of isolation and explains that the rapid rate of spread rendered it impossible to carry this out beyond a short time in every case, mild as well as severe. In this connexion he recites some highly important observations on the stage of the disease at which the infection was passed on to healthy persons. In regard to the point mentioned by Dr. Latham during the Victorian discussion that the disease breeds true and that severe infections usually beget severe infections, he gives a guarded and perhaps somewhat modified acquiescence. In his experience the severest cases are the most infectious, but he cites chapter and verse to show that there are exceptions to this rule. No doubt the resistance of the person infected and the tendency on the part of Nature to avoid segregation of individual bacteria of different habits explains the exceptions. Again his reference to the wisdom of restricting crowded assemblages denotes that he places a high value on the prophylactic measure of isolation. In respect to the other means that have been taken in the attempt to check the spread, he is laudably cautious. We have questioned the value of masks when worn by uninfected persons, on the ground that the infective material sprayed or otherwise distributed by an infected person in the neighbourhood of the masked individual has ample opportunity of soiling hands, exposed portions of the face and neck and clothes and from these situations it may quite conceivably be carried on to a mucous surface. Masks as they are worn to-day in Sydney by the vast majority of persons could not act efficiently in arresting the virus on its path to the nose and mouth. Concerning vaccination, he prefers to reserve judgement, pending a full report from the three New South Wales

Commissioners. The Commissioners have wisely announced at the commencement of their labours that there is no evidence that the vaccines at present in use can prevent the initial infection. We understand that statistical evidence will shortly be published, revealing how far inoculation with the Commonwealth vaccine is capable of modifying the course of the disease and of preventing a fatal issue. It has yet to be demonstrated whether the mitigating effect is applied to greater advantage when the vaccines are introduced into the body in the early stages of the illness or whether it is better to anticipate an infection by inoculating the healthy members of the community. In the last place, he has scarcely any faint praise to mollify his damnation of the zinc oxide spray. In the light of his illuminating article, we are confirmed in the views expressed in this journal on January 25, that there is need for caution and that of the vaunted measures adopted to prevent or modify the disease, the only one that can be implicitly relied on is isolation.

LUMBAR PUNCTURE AND MENINGITIS.

In the year 1891 H. Quinke devised a method of inserting a needle into the spinal theca for the purpose of withdrawing a sample of the cerebro-spinal fluid. The method was utilized at first for the purpose of differentiating tubercular from simple meningitis. At a later date the same technique was employed in spinal anaesthesia, and still later it became a routine method of examination in a large number of pathological conditions. The puncture is practically painless and the procedure is held to be so simple and so harmless that no one hesitates to apply it when information concerning the condition of the meninges or of the cerebro-spinal fluid is sought. From time to time it has been noted that the fluid is clear and free from detectable cellular contents at the first examination, while a sample withdrawn a day or two later proves to be clouded and to contain leucocytes in abnormal numbers. Moreover, records exist of the fact that symptoms of meningismus have developed a varying number of hours after lumbar puncture has been carried out. Notwithstanding these observations the practice continues unrestrained, and the possi-

bility of definite harm accruing from a lumbar puncture does not appear to occur to any clinician. We are informed that some months ago Dr. Reginald Webster, the Pathologist at the Children's Hospital, Carlton, recognizing the possibility that lumbar puncture at times seemed to determine a meningitis, undertook an investigation into this question, and obtained evidence which led him to the opinion that lumbar puncture was not the harmless procedure it was held to be. Dr. Webster will, no doubt, publish his experimental data at a later date. In the meantime four American Army Surgeons, working at the Army Neuro-Surgical Laboratory at the Johns Hopkins Medical School have demonstrated that in cats and other animals a septicæmia caused by *Bacillus mucosus-capsulatus* can be transformed into a meningitis by performing lumbar puncture after the infection has been established.¹ The authors, Captain Lewis H. Weed, Paul Wegforth, James B. Ayer and Lloyd D. Felton, noted that intravenous injections of *Bacillus mucosus-capsulatus* gave rise to a typical septicæmia, but in no instance were the meninges involved unless the bacilli were introduced into the spinal theca. They performed lumbar puncture on one of the septicæmic cats and on the following day the animal exhibited signs of meningeal irritation. The fluid withdrawn at this time was found to be invaded by the bacterium. The cat died. The experiment was repeated with the same result. It was ascertained that the phenomenon was not peculiar to cats, for a meningitis was produced in rabbits, guinea-pigs, white rats and monkeys by the introduction into a vein of a bacterium capable of inducing a meningitis when injected into the spinal canal, and the subsequent puncture of the spinal canal. There is strong evidence in favour of the contention that the meningitis in these cases is not due to a direct infection along the track of the needle. The bacteria seem to gain entrance to the sub-arachnoid space of the cerebrum before the spinal membranes are involved. The distribution of the exudate does not correspond to that of a traumatic meningitis arising from a lumbar lesion. It is thus probable that the bacteria circulating in the blood channels, find an opportunity of invading the meninges when the removal of cerebro-spinal fluid has temporarily modified the balance between the cir-

¹ Journ. American Medical Association, January 18, 1919.

culating blood and the cerebro-spinal fluid. Whether this change is due to an alteration in the osmotic pressure or whether the endothelial cells of the capillaries undergo physical damage as a result of the withdrawal of fluid remains to be demonstrated. In the light of Dr. Webster's experience and of the experimental observations of the American workers, it would seem that caution should be exercised when a lumbar puncture is to be carried out. Unless there is definite evidence of meningitis, this procedure is not to be undertaken lightly. It would probably be wise to refrain from applying it when an infection exists with an organism which is known to have affinity for the cerebro-spinal membranes.

THE SIGNIFICANCE OF SPRUE.

Very many medical practitioners in Australia have yet to see a case of pellagra or one of sprue. But while the former is rare in the Commonwealth, the latter occurs by no means infrequently among the inhabitants of the tropical districts of Queensland. That sprue is a very serious disease cannot be denied, and it is equally evident that this affection should attract the attention of those practitioners who devote time and energy to the work of prevention of disease. The fact of its prevalence in the north renders it essential that every practitioner should be prepared to recognize a case when it is present in a patient seeking his advice. According to Dr. Lucius Nicholls, the Director of the Bacteriological and Pasteur Institute at Ceylon, sprue, pellagra and scurvy have so much in common with one another that the diseases may be almost indistinguishable.¹ The earliest signs of typical sprue are entirely digestive. The patient complains of dyspepsia, the tongue becomes sore and there may be superficial denudation. Ulceration appears in the mucous membrane of the mouth. A little later the tongue acquires a very characteristic appearance. The surface is red, glazed and clean, and small, deep ulcers are scattered in patches over the organ. Diarrhoea appears at this stage. The stools are cream coloured, voluminous and frothy from excessive fermentation. In well-marked cases the characters of the motion suffice to distinguish the condition from pellagra. The oral implication may lead to a confusion with scurvy, but in the latter condition soreness of the gums and buccal mucosa is not associated with diarrhoea. It is well to remember that all three affections are apyrexial. In sprue there is no actual skin rash, but the skin of the forehead, back of the hands and other exposed parts may become roughened and present a mottled appearance. In pellagra a definite dermatitis occurs in the exposed areas of skin. This is said to be due to the injurious effects of sunlight. Purpuric rashes may occur in scurvy. Dementia and

neuritis are held to be common in pellagra, but are absent in both the other diseases. Similarly, the changes in the muscles, joint and periosteum of scurvy, ascribed to hæmorrhages, are never seen in pellagra or sprue. In all three affections extreme emaciation develops in the advanced stages and is suggestive of starvation. In both sprue and pellagra the internal organs participate in this extreme emaciation. The weight of the liver and spleen may be very greatly reduced. The mucous membrane of the intestine and stomach becomes degenerated, thinned and eroded. In extreme cases of sprue or pellagra the intestinal wall may be so wasted that it is practically transparent. The changes in the organs in the three diseases consist in degeneration of parenchymatous cells leading to atrophy, cirrhosis and capillary hæmorrhages. The hæmorrhages are more numerous and larger in pellagra and scurvy than in sprue. In sprue there are no degenerative changes in the nervous system, as there are in pellagra. Sprue is essentially a disease of Europeans living in the tropics, while pellagra is an affection of the poor, whose principal article of diet is maize. Dr. Nicholls holds the opinion that sprue is an infection grafted on to a condition produced by some form of deficiency in diet. He claims that an organism indistinguishable from *Streptococcus viridans*, of low virulence and having a special affinity for the tissues of the alimentary tract, plays an important part in the ætiology of this affection. He holds the view that infection is one of the causal factors in pellagra and he supports those who hold similar views concerning the ætiology of scurvy. The absence of a constituent from the diet, however, is granted in all three diseases. In the case of sprue this factor is of far smaller importance than in pellagra, while the deficiency of an essential vitamine is undoubtedly of paramount importance in scurvy. The Europeans who develop sprue in Ceylon and India always give evidence of having made material changes in their mode of life, and especially in their diet. It is somewhat suggestive that a mild ulcerative affection of the mouth and fauces is met with among the Cingalese. It is suggested that these people possess a racial immunity to sprue, since no other lesions than the stomatitis and involvement of the upper areas of the alimentary tract are met with. In Queensland the condition usually affects Europeans and Americans and it is much less prevalent in persons born in the tropics.

THE MICRO PLATE.

The increasing complexity of the bacteriological identification of micro-organisms demands greater employment of the process of cultivation. The preparation of the liquids and solids upon which the microbes are to be sown, entails much labour and occupies much time in laboratories where any attempt is made to carry out routine examinations with the accuracy requisite for exact determinations. The cost of the necessary large quantities of these media is becoming so large that many laboratories are unable to conduct some kinds of examinations or are forced to adopt less costly methods, while recognizing some loss in efficiency. An attempt has been made at the Harvard

¹ Journ. Trop. Med. and Hygiene, February 1, 1919.

Medical School by J. Bronfenbrenner and M. J. Schlesinger¹ to simplify the procedure of the laboratory and to diminish the amount of media used. They have substituted culture in drops of media for growth in test tubes. This alteration not only reduces the amount of medium to a negligible quantity, but also lessens the number of glass vessels, since it removes the necessity of using individual tubes for each test. The labour of many hours weekly has been saved which was formerly spent in washing, plugging, filling and sterilizing glassware. The introduction of the micro plate has also lessened the number of manipulations in many bacteriological and biochemical operations so that each worker in the laboratory has carried out a greater number of examinations during each day.

The micro plate can only be used when the medium contains agar, gelatine or some semi-solid substrate. At Harvard Petri dishes, ten centimetres by fifteen millimetres, have been used. One such dish accommodates thirty separate cultures. The drops are placed systematically by means of a stencil. With a sterile pipette drops of the melted medium are placed on the marked spot. These pipettes are made from ordinary glass tubing by drawing them out in the flame before use. A cubic centimetre of medium yields fifty drops. The drops solidify quickly on the cold glass. They are inoculated with a platinum loop in the usual manner. A second drop of the medium is then applied to cover and to reinforce the original mass of nutrient medium. During incubation the air of the warm chamber is kept moistened. This technique can be used for many purposes. The liquefaction of gelatine is readily observed up to ninety-six hours, but the drops become too dry if the test is prolonged over four days. The amylolytic action of bacteria is easily studied, hydrolysis being complete in the drops of starch agar in twenty-four hours. The dishes are flooded with iodine water to demonstrate the absence of starch. The formation of sulphuretted hydrogen can be detected by the use of lead acetate agar, but seventy-two hours are often necessary for the completion of this reaction. The reduction of nitrates can be followed when a suitable medium is used and the plate flooded with sulphanilic acid and alpha-naphthylamine reagent. The fermentation of different carbo-hydrates is readily carried out as far as the formation of acids is concerned, but the diffusion of carbonic acid gas makes the detection of gas uncertain. When it is necessary to observe the liberation of gas with certainty, it is needful to place a sterilized glass cover-slip on the top of the drop. The glass hinders the dispersion of the gas and leads to the production of bubbles, which are easily seen.

These methods have been evolved under the auspices of the Advisory Committee of the National Research Council and merit a trial in every laboratory.

THE PHYSIOLOGICAL ACTION OF RADIATIONS.

The last few decades have witnessed many observations on the physiological effects of different kinds of radiation. Not only have many facts been noted on

the influence of the rays giving rise to sensations of heat and light, but also much information has been gathered together about the changes in vital phenomena excited by the less evident forms of radiation. Since the physicist and the mechanical engineer have devised means for obtaining powerful sources of the rays lying beyond the range of the solar spectrum, it has been abundantly proved that these rays of varying frequency can greatly change the functions of living cells. The experiments that have been conducted with ultra-violet rays, Röntgen rays and with beta and gamma radiations upon man and higher animals, furnish us with many interesting observations, but are less suited for the elucidation of the principles on which the action of these powerful agents depends, than investigations on the more primitive animal and vegetable unicellular organisms. Recently many experiments¹ have been made by W. T. Bovie on the effects of ultra-violet light upon the rate of division of *Paramecium caudatum*. It has been found that the effects of ultra-violet rays vary with the wave length. While the ultra-violet rays which are derived from quartz, readily inhibit the reproduction of the infusoria, the ultra-violet light from fluorite has no effect upon the division of the *Paramecium*, but leads to cytolysis. An effective method has been discovered for determining the absorption index of fluorite rays in protoplasm. From these studies it has become evident that the differences that can be noted in the effects of ultra-violet light of varying wave lengths, depend on the power of penetration of the rays. The ultra-violet rays from fluorite are unable to penetrate to the nucleus, while the quartz rays give rise to photo-enucleation. The physiological action of radiation depends upon the alterations produced in the colloidal substance composing the living organism and in the dynamic changes taking place in these bodies. Any alteration which may be brought about by radiating protoplasm, will be capable of inaugurating physiological and morphological disturbances. It matters little whether the action of the radiation is physical or chemical. Changes of one kind will undoubtedly involve changes of the other. Whether an alteration is brought about in the protoplasm will depend upon whether the rays are absorbed and whether the absorbent substance or those intimately associated with it are photo-sensitive. In the visible and ultra-violet regions of the spectrum, absorption will be related to molecular composition, while, in the Röntgen and gamma regions, it will be associated with the atomic constitution of the irradiated protoplasm. The initial change produced by the radiation may not be extensive. It is probably slight with special sense organs readily excited by light. The change will appear later as structural and functional when the affected protoplasm becomes a factor in the structure or function under examination. These manifestations will be recognized according to whether the methods used for investigation are suitable or the reverse. Pronounced changes may be observed in the morphology of the tissues with the naked eye. The microscope will reveal less evident alteration. Studies on permeability will disclose changes

¹ Journ. Med. Research, Vol. XXXIX., p. 267, November, 1918.

¹ Journ. Med. Research, Vol. XXXIX., p. 251, November, 1918.

not seen with the microscope. None of these alterations are the initial effects of the radiation, but are after effects developed within the cell and they will vary in nature in the same way as the particular process under investigation.

LATENT MALARIA.

In a thoughtful article in which he discusses the problems presented by the transference of troops to a malarial district, Professor Frank G. Haughwout turns his particular attention to the detection of carriers of the plasmodium who show no apparent signs of the disease.¹ He is inclined to regard these persons as much more dangerous to the community than persons who suffer ostensibly from malaria, or those who are aware that they have had malaria and who will almost certainly suffer relapses at a future date. It was formerly held that an infection was always manifested by fever within ten to fifteen days of the bite of an infected anophiline, but evidence has been adduced to show that a person may become infected and may remain in perfect health for an almost indefinite period. The introduction of some exciting cause, such as excessive effort, may awaken the plasmodium to activity. In these circumstances, the protozoologist often has a very difficult task in demonstrating the infection. Ordinary blood films may fail to reveal anything abnormal, even after a long search. Better prospects are present if Ross's thick films are employed. The presence of a mononuclear leucocytosis, of pigmentation of leucocytes or of a transient leucocytosis should awaken suspicion of malaria. It may be advisable, when the search has proved futile, to attempt the cultivation of the plasmodium by Bass's method, or by one of its modification. These methods, however, are complicated and are of difficult technique. It is therefore suggested that the next step to be taken to discover a carrier is to apply one of the provocative methods. It has been shown that in many cases the gametocytes or the trophozoites hide in the spleen or bone marrow and it is difficult to tempt them to emerge into the peripheral circulation. Adrenalin, ergot and pituitary extract are said to compel them to come into the open. Similar claims have been made for strychnine and berberin, but there appears to be some doubt whether these drugs are endowed with this power. While the protozoa are in the spleen they are little accessible to quinine, and consequently it is futile to exhibit this drug until they have been driven out. When these methods fail, injections of milk or of horse serum may be employed, although opinions differ as to the efficacy of these biological substances. On the other hand the use of the quartz lamp is said to have a powerful effect in dislodging them from the organs. Professor Haughwout announces that he is engaged in a study on the action of adrenalin and the other drugs named above, especially in regard to the effect produced by their exhibition on the sugar content of the blood. It has been suggested that the appearance of the gametocytes in the peripheral circulation may be conditioned by the concentration of the blood sugar. If all these means fail to reveal a latent infection, the patient

should be kept under medical supervision and the effects of physical exertion, muscular fatigue and exposure should be carefully watched. In the event of the detection of the plasmodium, quinine should be given so as to destroy them as fast as they leave their hiding places. On the other hand it must be recognized that prolonged treatment is required to rid the blood effectively of gametocytes, since there is reason to suppose that the asexual forms may persist for a long time, even if the life of a gametocyte in the blood of a person free from malarial attacks appears to be relatively short.

Public Health.

NEW SOUTH WALES.

The following notifications have been received by the Department of Public Health, New South Wales, during the fortnight ending April 12, 1919:—

	Metropolitan District.		Hunter River District.		Rest of State.		Total.	
	Cs.	Dths.	Cs.	Dths.	Cs.	Dths.	Cs.	Dths.
Enteric Fever ..	11	1	8	0	43	3	62	4
Scarlatina ..	5	0	0	1	32	0	37	1
Diphtheria ..	39	1	20	1	76	0	135	2
*Pul. Tuberculosis	22	16	8	0	0	0	30	16
P'monic Influenza	1318	293	†	—	145	—	—	—

* Notifiable only in the Metropolitan and Hunter River Districts, and, since October 2, 1916, in the Blue Mountain Shire and Katoomba Municipality.

† No notifications received from Hunter River District for week ending April 12, 1919.

VICTORIA.

The following notifications have been received by the Department of Public Health, Victoria, during the fortnight ending April 13, 1919:—

	Metropolitan.		Rest of State.		Total.	
	Cs.	Dths.	Cs.	Dths.	Cs.	Dths.
Enteric Fever ..	1	0	16	0	17	0
Scarlatina ..	39	0	40	0	79	0
Diphtheria ..	86	2	76	5	162	7
Pulmonary Tuberculosis	33	28	10	6	43	34
Puerperal Fever ..	2	0	2	0	4	0
Influenza ..	3444	142	324	33	3768	175

QUEENSLAND.

The following notifications have been received by the Department of Public Health, Queensland, during the fortnight ending April 12, 1919:—

Diseases.	No. of Cases.
Enteric Fever ..	51
Scarlatina ..	13
Diphtheria ..	193
Pulmonary Tuberculosis	11
Erysipelas ..	1
Anchylostomiasis	3
Puerperal Fever ..	2
Cerebro-Spinal Meningitis	3
Poliomyelitis ..	13
Pneumonia ..	15

TASMANIA.

The following notifications have been received by the Department of Public Health, Tasmania, during the fortnight ending April 12, 1919:—

Diseases.	Hobart Cases.	Launceston Cases.	Country Cases.	Whole State Cases.
Enteric Fever ..	1	1	11	13
Diphtheria ..	4	10	19	33
Scarlatina ..	0	1	1	2
Pulmonary Tuberculosis	1	0	1	2
Poliomyelitis ..	0	0	1	1

¹ The Philippine Journal of Science, Sect. B., Tropical Medicine, Vol. XIII., No. 6, November, 1918.

Abstracts from Current Medical Literature.

PATHOLOGY.

(146) A Case of Mucor Infection.

H. C. Ernst (*Journ. Med. Research*, November, 1918) describes a mould found in a sample of sputum sent to the pathological laboratory at Harvard Medical School. Thread-like clumps resembling mycelia were seen in the preparations. Since small masses of similar mycelia were found in the methylene blue used as a staining fluid, this appearance was ascribed to contamination and a fresh specimen of sputum was sought. The second sample yielded no tubercle bacilli, but the same thread-like forms were present after the use of many different stains. Cultures were made from the sputum and a growth of a *Mucor* was obtained after a number of days at room temperature. Close study of the cultures showed the mould to be *M. corymbifer*. The infectious character of the mould was shown by the appearance of a slow chronic abscess in the peritoneal wall of a guinea-pig after injection with an emulsion from a pure culture of the mould. Spores and mycelia were demonstrated in the pus from this abscess and a pure culture of *M. corymbifer* was recovered from it. The patient was a young man in training at Fort Constitution with a family history of tuberculosis. Five months previously he began to feel weak, suffered from headaches and pains in the chest and experienced a sore and dry throat. On admission to hospital the patient showed slight fever, acute inflammation of the pharynx and larynx and coarse râles in the upper lobes of both lungs. Cough was present along with thick, profuse expectoration. Several examinations had been made at the Fort for tubercle bacilli, but without success. A sample of sputum was then sent to the Departmental Laboratory at Harvard. On three separate occasions pure cultures of the mould were obtained. Personal examination of the patient showed that the chest signs were normal, the only lesion discoverable being small ulcers on the vocal cords. The aetiological factor is presumed to be the *Mucor*. The infection may have been occupational, as the young man was in private life a farmer cultivating maize.

(147) Experimental Organizing Pneumonia.

A. B. Wadsworth (*Journ. Med. Research*, November, 1918) has made a study of the pneumonia produced in dogs by the tracheal injection of cultures of pneumococci and staphylococci. While the lesions of unresolved and organizing pneumonia have been subjected to extensive study in all their minute histological detail, it is not clear why one lesion should resolve, another continue unresolved and yet another undergo organization. Lungs exhibiting organizing pneumonia in man which had been preserved for some years have been examined microscopically. It was

not possible to demonstrate any bacteria in significant numbers in the sections, either owing to the absence of bacteria in the lesions or to the methods of hardening or to the failure of Gram's stain. As dogs are less susceptible to the effects of pneumococci than rabbits, some experiments have been made by injecting pure cultures into the trachea of anesthetized dogs. Following the tracheal injection of pneumococci the pulmonary lesions were examined at autopsies after fatal infections and at stated intervals during recovery. The pneumococci, which are present in large numbers during the first day, had completely disappeared from the extensive early lesions of red hepatization by the third day. Lesions with purulent infiltration, with necrosis and with abscesses were never seen. Dogs injected with staphylococci showed circumscribed broncho-pneumonic lesions in which resolution was delayed. In these areas the exudate was more cellular, the walls of the air spaces were thickened and small abscesses were present. The introduction of both pneumococci and staphylococci gave rise to a great variety of conditions. In many animals the infectious processes were evanescent, or one of the bacterial agents failed to develop. Other animals died during the earliest stages of the pneumonia. In a certain proportion of the animals diffuse exudative lesions were incited, in which resolution was delayed and the typical appearances of intra-alveolar organization were seen. In these cases a diffuse or confluent exudative broncho-pneumonia, partly acute and partly unresolved, was interspersed with organization extending from the walls of the air spaces into the alveolar exudate. In some dogs that survived about three weeks larger and smaller bronchiectatic cavities, induration and fibrous tissues were apparent. The microscope revealed strands or plugs of new vascular connective tissue passing into the air spaces from the walls of the alveoli and occasionally traversing the walls into neighbouring alveoli. By the injection of coloured gelatin into the blood vessels of other dogs suffering in the same way the capillaries in this new connective tissue could be readily demonstrated.

(148) Isolation of Bacillus Influenzae.

J. H. Brown and M. L. Orcutt (*Journ. Exper. Medicine*, November, 1918) describe a rapid differential method for the isolation of *Bacillus influenzae*. The method depends on the observation that the colonies of Pfeiffer's bacillus are most numerous and grow to larger size in the neighbourhood of colonies of certain other bacteria on a blood agar plate seeded with influenzal sputum. Tubes containing standard meat infusion agar are melted and cooled to 50° C. From a half to one cubic centimetre of defibrinated blood is added to the contents of the tube. After inoculation with a small loop of suitably diluted washed sputum the mixture is poured into a Petrie dish. When the agar has solidified, a very small loop of undiluted sputum is rubbed over the surface of the plate by a flamed glass rod. With-

out flaming the rod is then rubbed over the surface of a second blood agar plate prepared in the same way. The optimal distribution of colonies should be secured on one or other of the two plates. Each plate is streaked in the form of a single circle or cross with a pure culture of a markedly hæmolytic staphylococcus or streptococcus. The influenzal bacilli grow in the form of minute discreet convex colonies, often visible only by reflected light. These colonies are found in largest numbers and in greatest size in the zone of hæmolysis produced by the streak of staphylococci or streptococci. The microbes can be isolated in twenty-four hours.

(149) Hæmic Studies in Experimental Poliomyelitis.

H. D. Taylor has made 121 enumerations of the leucocytes on 40 normal monkeys, in addition to blood counts on six series of monkeys before and at various intervals after the injection of active poliomyelitic virus (*Journ. Exper. Medicine*, January, 1919). Immediately following the injection of the virus there is a diminution in the relative and absolute numbers of lymphocytes. In many animals this condition continues, while in others there is a return to normal on the fourth to the sixth day. With the onset of symptoms the polymorphonuclear leucocytes are relatively and absolutely increased. During the stage of prostration the polynuclear leucocytes return to normal numbers. An increase in the total number of circulating lymphocytes is coincident with the passing of the acute stage. At the time of the leucocytosis the eosinophilic, basophilic, large mononuclear and transitional leucocytes are all increased.

(150) Encystment of Amoebæ.

K. Yoshida (*Journ. Exper. Medicine*, October, 1918) has followed the evolution of the vegetative forms of *Entamoeba histolytica* outside of the host. It has been usually supposed that these vegetative forms die when discharged in the dysenteric fæces without giving rise to cysts. The author has succeeded in bringing about conditions under which the large vegetative forms become transformed into small vegetative forms and sometimes into cysts. This fact appears to be of great importance in the prophylaxis of dysentery. The material employed in the investigation has consisted of bloody mucous stools obtained from a patient who has been under observation for several years. Despite many kinds of treatment, this patient has never passed normally formed fæces. Numerous vegetative amoebic forms are present, but cysts have not been seen. No other forms of amoebæ have been ever observed in the stools of this patient. The amoebæ are grown between 22° C. and 27° C. in test-tubes through which a constant stream of horse serum diluted with four volumes of Ringer's solution is passed. Occasionally red blood cells are added to assist oxygenation. Under these conditions the amoebæ have lived on an average 51 hours, the period varying from 36 to 72 hours. Transition from large vegetative forms into cysts can

be traced *in vitro*. Invariably the large vegetative cyst becomes transformed into an intermediate form. Transitional forms, with altered nuclei, are produced. These become changed into the small vegetative forms from which the cysts are derived. Cysts are formed when the external conditions are unfavourable, but the small vegetative forms are changed into the large vegetative forms under favourable circumstances. There are also some atypical forms, which are converted finally into cysts. Whether the small forms are typical or atypical depends on the mode of division of the nucleus. When the nucleus divides mitotically the typical varieties are produced, but when the nucleus divides amitotically the atypical varieties make their appearance.

PÆDIATRICS.

(151) Mantoux Reaction in Children.

The Mantoux test consists in the intracutaneous injection of a solution of old tuberculin (0.005 mgr.) in salt solution. For control normal saline is advised and separate syringes used. Fine needles with short bevel are essential to avoid trauma. The best area for injection is the external surface of the arm, about 2.5 cm. above the elbow. The needle, bevel edge up, is slowly introduced between the layers of the skin and the solution injected. A small white area, resembling a wheal, is raised. The control solution is injected about 4 cm. higher up the arm. Following this technique Reiss (*Arch. of Pediatrics*, December, 1918) employed the test in 120 cases, using it as a check on a previous von Pirquet test. In 19 cases a positive reaction appeared. (a) The reaction appeared as early as six and never later than twenty-four hours. (b) The intensity of colour varied from a pink to a bright red. (c) The lesion presented a central papule, oval in shape and varying in size from 0.4 to 0.6 cm. long and 0.2 to 0.4 cm. wide, this being surrounded by an areola, the size of which varied with the intensity of the reaction. (d) The reaction usually reached its maximum in 24 to 36 hours, at which point it remained stationary for about 24 hours and then gradually began to fade, taking on at first a violet tinge, then a brownish hue and ending in desquamation on the fifth to the twelfth day. (e) No pain accompanied any of the reactions. (f) No constitutional reaction occurred in a single case. The von Pirquet test was never positive in the absence of a positive Mantoux test, and it was negative in three cases in which the Mantoux reaction was positive. The sensitivity of the skin, as shown by the appearance of the control, was lowered in patients with a low vitality and increased in others with a heightened nervous irritability. From the age of two months onwards there was an increasing percentage of positives with increasing age. The nutritional state of the patient did not apparently enter as a factor in the reactions. Seventeen of the nineteen giving positive reactions displayed adenopathy, the posterior cervical glands being the

principal seat of enlargement in sixteen. Of the 101 yielding negative reactions only thirteen showed adenopathy and only in two was there posterior cervical gland enlargement. A family history of tuberculous was obtainable in only two patients, both of whom gave a positive reaction. Tuberculous meningitis cases apparently do not respond to cutaneous tuberculin tests.

(152) Purpura Abdominalis in Early Life.

Weston (*Arch. of Pediatrics*, November, 1918) describes in detail three cases of *purpura abdominalis* and mentions several others occurring in his practice. The disease is usually associated with arthritis and angio-neurotic oedema. The causal factor is unknown. The onset is usually characterized in children by loss of appetite, headache, irritability and great thirst, which usually lasts through the attack. Then come the abdominal crises, followed by the purpuric rash, or *vice versa*. Often there are severe joint pains. The spots may be so few as to be overlooked. They appear on any part of the body as small purple punctate spots or as definite dark purple spots varying in size from a pea to a sixpence, or both varieties may occur together. Vesicles and papules may also be present with great burning and itching of the skin. The abdominal pain is distinctly colicky in character and often very severe and difficult to relieve. It usually occurs in the epigastrium, but shifts about. The abdomen is usually very tender and rigid and the bowels are constipated. Treatment is usually by means of calcium lactate, but the use of human serum in 1 c.cm. doses injected daily for ten days effected a cure in two of the author's reported cases, where the calcium salt proved of little value. In purpura the blood platelets are markedly reduced and the injection of human serum leads to a large and rapid increase in their number.

(153) Feeding in Marasmus.

From a study of over one thousand atrophic infants Reuben (*Medical Record*, July, 1918) is convinced that no patent food is of any avail where properly modified milk, with the addition of carbo-hydrates, has failed. The author considers that (1) the most common cause of marasmus is improper alimentation; (2) intolerance for milk as a whole, or for any of its elements, is the least common cause; (3) for every case of malnutrition due to intolerance there are nine due to under- or over-feeding, irregular feeding, improper technique or method of food preparation. An exhaustive study was undertaken to determine the value of "skimmed," "whole" or "top" milk as proper substitutes for breast milk, where the latter was not available. A large number of infants were fed on each kind of food and were kept under observation for from one to two years, the effects of each method of feeding on the development, the morbidity and the mortality of the infants being carefully noted. The conclusions drawn are: (a) that the best substitute for breast milk is a proper dilution of "whole" milk; (b) that "skimmed"

milk, though not suitable as a permanent food for healthy infants, is of great value as a temporary food in all chronic cases of malnutrition, in which the infants presented no gastro-intestinal symptoms and were very much underweight; (c) "skimmed" milk, with a high percentage of carbo-hydrates, produce a more rapid gain in weight than any other mixture known.

(154) Perlèche.

Perlèche is an infection of the labial commissures, manifesting itself (1) by a maceration of the epithelium, (2) by a degeneration of the tissue and (3) by the formation of shallow ulcers and cracks. Smith (*Arch. of Pediatrics*, 1917, p. 274) isolated an anaerobic streptococcus at an early stage of the disease in 135 cases; in combination with *Staphylococcus pyogenes aureus* 26 times; with *Staphylococcus albus* 7 times and with the *Streptococcus pyogenes* 14 times. Later the anaerobic coccus was not found at all. *Staphylococcus pyogenes aureus* was found alone 36 times and associated three times with the *Streptococcus hemolyticus*. Perlèche is more prevalent during the winter (73% of cases). It appears to be secondary to abnormal conditions about the oral and nasal cavities, causing an increased flow of saliva. It is usually bilateral. It may be distinguished from impetigo, which does not begin at the mouth angles and which is more widespread, and from syphilis, in which the lesions are deeper and more widespread, are copper-coloured and usually affect the mucous membrane of the mouth, where perlèche rarely appears. Treatment consists in painting the lesions with 50% silver nitrate solution, followed by the application of Lassar's zinc paste to the dried surface. If cure does not result in a few days spirits of camphor or alcohol is applied. Belladonna should be given internally to control the flow of saliva.

(155) Early Signs of Post-Diphtheritic Paralysis.

Gott (*Münch. Med. Woch.*, 1918, LXV., p. 669) points out that one of the earliest signs to appear in diphtheritic paralysis is the facial or Chvostek's phenomenon. This is a contraction of the cheek muscles on local stimulation of the facial nerve in the cheek by tapping with the finger or a small hammer. Another early sign is increased activity of the knee-jerks. Chvostek's phenomenon and increased knee-jerk may be present in the beginning of convalescence from diphtheria before there is any suggestion of paralysis. In the majority of cases Chvostek's sign disappears entirely, and the knee-jerks become normal, without any palatal or ocular paralysis occurring, but children who show the facial phenomenon and increased knee-jerks after diphtheria, are much more likely to develop paralysis than those in whom these symptoms are absent. The practical significance of this is that by continual examination of these reflexes from the beginning of convalescence, it may be possible to detect those pre-disposed to paralysis, and then institute the necessary treatment.

British Medical Association News.

SCIENTIFIC.

A clinical meeting of the New South Wales Branch was held at the B.M.A. Building, 30-34 Elizabeth Street, Sydney, on April 11, 1919, the President, Dr. F. P. Sandes, in the chair.

Dr. W. G. Armstrong opened a discussion on pneumonic influenza by reading a paper dealing with its epidemiology (see page 331).

Dr. J. Burton Cleland read a portion of a very long paper on some aetiological and pathological aspects of the influenza outbreak. In submitting his opinions to the meeting, he stated that he was not wedded to the views expressed, but was prepared to recede from any or all of them in the light of fuller information. He first dealt with the nature of the causative organism, concerning which opinion was still divided. He referred to a statement that he had made at a meeting of the Council of the New South Wales Branch and the officers of the Public Health Department in November, 1918, to the effect that the virus might be a member of the filter-passing group. He claimed that this suggestion was made deliberately, as a warning against precipitate action being taken in connexion with attempted protective inoculation by vaccines. The extensive inoculations had apparently not diminished the liability to contract the primary disease, but they seemed to have been of some service in diminishing the likelihood of pulmonary complications and of lessening their severity. The factors which impelled him to consider the possibility of a filter-passer were as follows:—

(1) The disease under certain unknown conditions was intensely infectious, resembling measles, in which a filter-passer was believed to play a part. The only bacterial disease in man which approached it in infectivity was pneumonic plague and in animals the pasteurillas.

(2) No single bacterial species occurred in sufficient numbers and in constant association with that disease and that disease alone to warrant the assumption that it was the cause. The influenza bacillus, while frequently associated with the disease, was very often found independently of it. Pneumococci, streptococci and the other organisms found in connexion with the disease were common denizens of the naso-pharynx.

(3) Carriers of the disease seemed to be non-existent.

(4) In contagious pleuro-pneumonia of cattle, a disease due to a member of the filter-passing group, the pulmonary lesions had a striking resemblance to the lesions met with in the exudative type of the lung complications of influenza.

He referred to some attempts he had made to convey the disease to macaque monkeys. These experiments had yielded negative results.

In the next place, Dr. Cleland discussed the question how the infection escaped from the patient. He claimed that some cases were intensely infectious, while others apparently were not infectious. At one time it was held that the infectious period was limited to the first few days of illness. Dr. Armstrong had evidence to show that patients might still be infectious after five days or longer. In considering how the virus escaped from the body, he dismissed the suggestion that this occurred from the skin, as there was no evidence of the presence of a rash. He also dismissed the suggestion that the infection was spread through the medium of urine or faeces. By exclusion he arrived at the conclusion that it made its exit by the mouth or nose. It might be present in the mucus from the naso-pharynx, in the saliva or on the moist lining of the pulmonary passages. He favoured the proposition that the infection was passed on by means of droplets of saliva.

In turning his attention to the question of air infection and gauze masks he developed an argument on the basis of Buller's experiments on the rate of fall in a closed vessel of the spores of some basidiomycetic fungi. Assuming that the virus had a specific gravity approximating that of water, he attempted to show that the rate of fall of the minute droplets of saliva containing the virus in a relatively still atmosphere without marked convection current, would be extremely slow and might even be hindered altogether. He argued that in an enclosed space with numerous convection currents, the droplets would be suspended for varying times and an invisible cloud of very minute particles might form

within the space. In the open air this cloud would not form on account of the power of breezes to distribute the droplets. He assumed that mass infection might occur in this way. In his opinion, gauze masks protected the individual in the five following ways. When worn by the infectious person, all the larger particles and half or more of the microscopical ones were caught on the inner surface of the gauze. When worn by the exposed person, the same was effected on the outer layer of the mask. In the third place, the mask acted as a partial filter in arresting suspended particles on the outside. In the fourth place, the mask filtered the circumambient air drawn into the lungs during inspiration; this air, with its particles impinged in part on the lattice-work of the mask and the particles tended to adhere to it. In the last place, the mask minimized the force and dispersed the effect of the inspiratory effort on the surrounding atmosphere. He recommended a double mask, with an air-space between the two portions to increase this fifth action.

The next point dealt with by Dr. Cleland was the pathology of the lung complications. He had had the opportunity of examining the lungs of about fifteen persons who had died of the disease. From his observations he distinguished two pulmonary processes, one consisting of extravasation of the blood into circumscribed areas of the lung, with formation of infarcts, and the other consisting of an extensive exudation, usually free from fibrin, filling the alveoli. In the later stages it was often difficult to recognize the primary hemorrhagic areas, owing to the degenerative changes in the exuded red cells. The appearance of the lungs was at times like that of the early grey hepatization of lobar pneumonia, but the changes were neither typically lobar pneumonic nor bronchopneumonic. He was of opinion that these changes were probably due to the direct effects of the primary virus. In what he assumed to be the early pulmonary complication there were few leucocytes. In the later stages these cells were uniformly distributed in the lacunae in the coagulated exudate. He had rarely seen pyemic foci surrounding a mass of staphylococci. He regarded the leucocytosis in these cases as independent of the chemiotactic action of bacteria. In his opinion the exudates and hemorrhages in the lung were not due primarily to the influenza bacillus or to the other bacteria; the exudates formed an admirable nidus for the growth of secondary invaders. In the last place, he stated that *Staphylococcus aureus* had apparently played an important part in the lung condition in several cases.

In summarizing his provisional conclusions, Dr. Cleland made the following proposals:—

(1) In addition to wearing a mask, every person who believed himself to be infectious should, as far as possible, keep absolute silence, answering questions by writing.

(2) The use of double masking might be tried.

(3) Infectious persons should be placed as far as possible in the open air or in well ventilated situations, to prevent the danger of infective particles in a still atmosphere.

(4) Nursing and treatment should be directed to measures calculated to diminish the liability to hemorrhage into the lung and to the pouring out of the exudate into the alveoli.

(5) If polymorphonuclear leucocytes, apart from bacterial infection, invaded the clogged alveoli and helped to "clear up the mess," any therapeutic measures tending to increase their number might be serviceable. He suggested yeast for this purpose.

(6) Before the patient became ill, every septic focus in the mouth or elsewhere should be attended to. During the illness, constant attention should be given to the cleanliness of the mouth.

Dr. T. M. Furber read a paper written by himself and Drs. H. V. D. Baret and A. L. Stafford, the text of which is published on page 333.

Dr. J. Macdonald Gill said that those present were under a debt to the readers of the papers. The epidemic appeared to him to be similar to epidemics that he had seen before. The symptoms of the disease were the same and the treatment was the same. There were three subjects to which he invited attention. Firstly, he noted a tendency to hemorrhage, especially from the lungs. These hemorrhages were not necessarily fatal. In some of the cases epistaxis had occurred, but he had not seen an instance of hemorrhage from the bowel. Secondly, there was cyanosis, which was not due to heart failure. The cyanosis occurred early in the disease and was a very bad sign. It was not due to heart

failure, nor to failure of the respiration. There were several alterations in the colour of a patient during the course of the disease. He held the opinion that this colour was a flush and not an erythema. He suggested that the function of the hæmoglobin had been interfered with. In the third place, he stated that he had been impressed with the favourable prognosis in children, though severe attacks were common among them. This had been noticed in previous epidemics. Dr. Gill was in favour of the patient wearing a mask, especially during an examination of the chest.

Dr. C. W. Reid said that their experience had been gained from the patients on board ship. They had come to the conclusion that the employment of sprays, masks and vaccines was of little use in preventing persons on board ship taking the disease. Their experience at North Head had led him to the conclusion that inhalations of zinc sulphate were of little antiseptic value. He had noted that those persons who frequented the inhalatoria and those patients who stayed too long under the sprays developed pharyngitis. They had employed a solution containing 1% of zinc sulphate. It appeared to them that it was inadvisable to submit patients to sprays containing a greater concentration of the antiseptic. He thought that doctors might wear a mask when examining patients, but that the continuous wearing of a mask did not prevent infection with the disease. He considered the use of masks in streets valueless. They had administered a dose of vaccine to every patient upon admission to the Station at North Head. A second dose was given on the third day, if required. The vaccine employed contained 125,000,000 *Bacillus influenzae* and 80,000,000 pneumococci. He thought that the therapeutic inoculation with a vaccine was helpful in diminishing the liability to heart failure and in lessening the risk of hæmorrhage. The administration of calcium lactate had been continued for some time and appeared to be useful in the cases of moderate severity. He was of opinion that no treatment had been of any avail in the severe cases. He instanced the example of nineteen natives from Polynesia, who had been infected with the disease on board ship. Of this group, five had died. About 25% of the total number of patients treated at North Head had been examined after recovery from their attacks of influenza and many had shown signs of pulmonary tuberculosis. There had been a number of patients whose disease had been complicated with empyema. He had employed the needle to evacuate pus and had repeated the aspiration when necessary. Dr. A. W. Dean had infected a rhesus monkey through the intranasal channel. *Post-mortem* the monkey had shown all the signs of influenza pneumonia. Every boat leaving Sydney at present was infected with the disease. Recapitulating his opinions, he said that he favoured the use of masks when attending patients, that inhalatoria were of no use and that vaccines modified the progress of the disease. They had studied the question of vaccines upon a warship on which the officers and crew had been inoculated three months previously. One hundred cases had occurred on board. He had concluded that there was no benefit from inoculation after six weeks. Perhaps re-inoculation should be done every month. He would like to ask members for advice as to the control of the delirium. He had found paraldehyde of some value and also hyoscine. Heroin was useful in controlling pain and also promoted sleep.

Dr. H. Ritchie offered some remarks on the protective power of prophylactic inoculation. As the members were aware, he was appointed to the Commission by the Government to advise on matters in connexion with the epidemic. He had not been able to find any evidence that any vaccine possessed any power in preventing the disease. Roughly, half the population of Sydney had been inoculated, and, roughly, the disease was appearing equally among the inoculated and the uninoculated. With regard to the secondary phenomena complicating simple influenza, there appeared to be some evidence that inoculation had a modifying influence on the disease. In a series of 393 cases treated at the Coast Hospital, Sydney, 136 cases occurred among inoculated persons and 257 among the uninoculated. Among the inoculated persons, there were 60 mild, 58 moderate, 10 severe and eight fatal illnesses, while there were 144 mild, 53 moderate, 31 severe and 29 fatal attacks among the uninoculated persons. Dr. Ritchie thought that they could draw no certain conclusion from these figures, as the total number was too small and the groups of unequal size. He was at variance

with Dr. Cleland's views as to the pathology of the pulmonary condition. He had not observed the condition of pneumonia, but regarded the state of the lungs as one of pneumonitis. Hæmorrhages sometimes occurred into the lung tissue and sometimes there was an exudation of albuminous fluid into the alveoli. He summarized the findings of the Commissioners, which have already been published in *The Medical Journal of Australia*, of April 12, 1919 (page 301).

He had made many enumerations of the leucocytes in the blood of patients suffering from influenza. The marked leucopenia had attracted his attention. If the number of leucocytes rose during the course of the illness to more than 12,000 per cubic mm., the prognosis was favourable. There were many other organisms besides pneumococci present in the pneumonic cases. Streptococci were frequently present and sometimes the influenza bacillus. As far as he had been able to judge pneumococci could be isolated in the majority of the cases so far examined in New South Wales. He agreed with Dr. Gill that the blue colouration was not due to heart failure. In the early stages there was a violaceous colour, which gave place later to blueness, consequent on interference with the absorption of oxygen.

Dr. John Morton contributed a few notes on a new aspect of the disease. He did not believe that influenza was an airborne disease and he did not think it was conveyed by droplets. He thought the medical profession was obsessed in favour of infection through the respiratory passages. He considered that the flea was the medium of transmission. He had noted that every epidemic disease was dependent upon an insect carrier. He instanced malaria, borne by a special mosquito; typhus, conveyed by bugs; dengue, distributed by mosquitoes, and plague, transmitted by the flea. Influenza was a disease which spread by contiguity. Masking and other remedies failed to prevent the disease, because they did not protect against insects. He had arrived at his conclusion by a process of exclusion. Influenza occurred when flies were not prevalent and when mosquitoes were absent. These insects could not transmit the disease. At the present time fleas were rather numerous. At the Walker Hospital precautions against infection through fleas were being adopted, and he noted that no contacts had contracted the disease, whereas in other hospitals in which precautions against fleas were not used, many attendants had taken the disease.

Dr. A. H. Tebbutt had made a number of leucocytic counts from which it appeared that there was a diminution in the number of leucocytes in the blood of those infected with influenza. Some observations on the time of coagulation of the blood showed that this appeared to be normal. In respect to the bacteriology, he had made twenty blood cultures from living persons, but had recovered only one organism, the pneumococcus, and that in pure culture. From material obtained at autopsies he had made twelve examinations of the blood from the right ventricle and of the serum in the lungs just beneath the pleura. From the blood he had obtained the pneumococcus upon four occasions, while, from the pulmonary serum, he had obtained the pneumococcus on six occasions. So far, he had not recognized any definite streptococci. Two of the micro-organisms that he had isolated were hæmolytic, but he considered them to be pneumococci. Up to the present, he had not found the influenza bacillus. He drew attention to the peculiar lividity observed in the cadaver. This appeared on the posterior portions of the trunk, but was rarely seen over the chest or anterior surface of the thighs, but appeared on the front of the neck and upon the face. The colour was more brown than the usual blue colour of the corpse. For a few hours after death discolouration disappeared upon pressure. On excision, free bleeding occurred in the livid areas. The left ventricle was found contracted in systole, while the right ventricle was rarely dilated. The right auricle was distended. The amount of yellow thrombus in the heart was less than in a frank pneumonia.

Dr. A. Aspinall asked how long the patients remained infective. Dr. Furber said that the medical staff at the Coast Hospital retained a patient for one week after the temperature had fallen to normal. So far, they had not observed any infection due to these convalescents.

Dr. F. P. Sandes asked how calcium lactate was administered at North Head.

Dr. C. W. Read said that calcium lactate was given in water by the mouth. He also stated that Pfeiffer's bacillus was present in the throat of most persons in quarantine, many of whom were not suffering from influenza. Some persons had been allowed to leave North Head while still harbouring the bacilli, but no infection of the community had taken place as a consequence.

Dr. W. G. Armstrong said in reply that he thought he should not be asked to combat the views of Dr. Morton until some tangible evidence was advanced in favour of transmission by fleas. Where there existed so overwhelming an opinion as to the mode of infection, he thought that it was unwise to devote attention to other channels. He regarded influenza as a disease of cold weather and he attributed the failure to control it to the short incubation period and not to the high degree of infectiousness. Small-pox was a more infectious disease than influenza. A person introduced into a room with a patient suffering from virulent small-pox would almost certainly contract the disease, unless vaccinated. In the case of influenza, a person might safely enter the room of a patient suffering from influenza, provided there was no contact with the patient's nasal and buccal secretions.

Dr. Cleland asked for details about the infection of the monkeys at North Head. He hoped that the information would soon be made available, so that other investigators might take advantage of the result. In regard to cultures from the lungs, he had obtained the *Staphylococcus aureus* in pure culture from two patients, the influenza bacillus from another patient, *Staphylococcus aureus* and *Bacillus influenzae* from a fourth patient and *Staphylococcus aureus* and pneumococcus from a fifth patient. A long series of these examinations should give them interesting results. An investigation was now being carried out to determine the types of pneumococci that had been isolated from the epidemic. This had not been done in the early stages of the epidemic, as the Bureau of Microbiology had not possessed sufficient pneumococcal cultures.

Dr. Furber said that he also would be pleased to receive any suggestions in regard to remedies suitable to quieten the patients with delirium.

Dr. F. P. Sandes asked about the effect of lumbar puncture.

Dr. H. Ritchie said that two cases at Sydney Hospital had been treated with lumbar puncture without effect. He related the history of a patient who had received several hypodermic injections of morphine, hypodermic injections of heroin and finally a mixture of ammonium bromide and chloral. The history of this patient illustrated the enormous quantity of narcotics that could be taken by a patient without producing sleep.

A member suggested that this patient slept at last in consequence of a turn for the better.

ELECTION OF OFFICE-BEARERS.

At the annual meeting of the Western Australian Branch, which was held on November 23, 1918, the following office-bearers and members of the Committee were elected:—

President: Dr. F. A. Hadley (Perth).

Vice-President: Dr. A. T. White.

Ex-President: Dr. R. C. E. Atkinson (Perth).

Honorary Treasurer: Dr. W. Trethowan (Perth).

Honorary Secretary: Dr. C. H. Shearman (No. 9, Bank of New South Wales Chambers, St. George's Terrace, Perth).

Members of Council: Dr. Dixie P. Clement (Perth), Dr. R. C. Mereweather (Perth), and Dr. E. A. Officer (Perth).

Ethical Committee: Dr. Dixie P. Clement (Perth), Dr. R. C. Mereweather (Perth), and Dr. E. A. Officer (Perth).

Honorary Auditors: Dr. M. K. Moss and Dr. A. E. Randell.

The following have been elected members of the New South Wales Branch:—

Walter Watson Feather, Esq., M.B., Ch.M. (1919, Univ. Sydney), 28 St. George's Crescent, Drummoyne.

Aubrey Philip Gunning, Esq., M.B., Ch.M. (1918, Univ. Sydney), Sydney Hospital, Sydney.

Edward Culbertson Hope, Esq., M.R.C.S. (Eng., 1896), L.R.C.P. (Lond., 1896), 9 Addison Road, Manly.

Donald Stuart Mackenzie, Esq., M.B. (1909, Univ. Sydney), Urana, New South Wales.

Idris Morgan, M.B. (1915, Univ. Sydney), Commercial Bank Chambers, Hunter Street, Newcastle.

William Thomas Nelson, Esq., M.B., Ch.M. (1918, Univ. Sydney), Sydney Hospital.

Clive Farran-Ridge, Esq., M.B. (1915, Univ. Sydney), 50 Wigram Road, Glebe.

Bernard Hilliard Simon, Esq., M.B., Ch.B. (1916, Univ. Edinburgh), 69 Johnston Street, Annandale.

The undermentioned have been elected as members of the Queensland Branch:—

Harvey S. Walsh, Esq., M.B. (1913, Univ. Sydney), Brisbane.

Jerome O'Flynn, Esq., M.B., Ch.B. (N. Univ. Irel., 1913), Gin Gin, Queensland.

Correspondence.

NON-MEDICAL CORONERS.

Sir,—In the coroner's findings on the sulphite poisoning case as published to-day we find the statement that barium sulphate has only been used for opaque meal examinations since the outbreak of war, on account of the increase in cost of bismuth salts, and he incidentally conveys the impression that there is danger in the use of the barium salt.

This statement is quite incorrect.

Barium sulphate has been used for many years and I have personally been using it almost exclusively for over eleven years, and in America bismuth salts are practically unknown for opaque meal work.

Further, there is no more danger in the use of barium sulphate than in the use of sugar of milk; a coroner might as well condemn the latter, because in recent years strychnine was accidentally dispensed in mistake for sugar of milk.

We must, however, expect these inaccuracies when so important a post as coroner is filled by non-medical men.

Yours, etc.,

J. G. EDWARDS.

"Craignish," Macquarie Street,
Sydney, April 15, 1919.

SACCH. UST.

Sir,—Some time ago the Government of New South Wales appointed a board of medical men to assist them in dealing with the influenza pandemic.

The qualifications of these gentlemen (or of any other medical man who might have been appointed) seems to be as follows:—

(1) They do not know the cause of the disease.

(2) They do not know how to prevent the spread of the disease.

(3) They cannot cure the disease.

These three propositions seem to sum up concisely all we know about influenza.

From a practical point of view, our knowledge of the scourge is much on a par with that of our ancestors, who considered these plagues to be due to the sinfulness of mankind or the machinations of the devil.

Firstly, as to the cause. We are assured on all hands that the disease is due to some unknown organism, which is assumed to be ultra-microscopic. On the contrary Rosenau, who is considered to be some pathologist, makes a definite statement that the epidemic is not due to a filterable virus.

We have also been assured that it is due to a Gram-positive diplococcus of unknown antecedents. It has even been stated that the disease has been reproduced by a pure culture of this organism. Just now, however, the unknown diplococcus seems to be rather under a cloud. What has become of him I am unable to find out, unless he has turned out to be a long lost brother to the pneumococcus, perhaps disowned by that family owing to dissolute habits.

With regard to the influenza bacillus, there seems to be vast silence concerning it on the part of our bacteriologists. If one asks where the influenza bacillus comes in, one is met with rather a chilling silence, as though one had mentioned some topic which is never discussed by polite people. It appears that this germ does not come in at all, but rather seems to hover hesitatingly upon the doormat, like some poor and rather disreputable relation. I fancy that it was

Mr. Podsnap who abolished Napoleon Bonaparte with a wave of his hand. Our bacteriologists seem to have abolished this bacillus in some such way, but unfortunately this annoying germ refuses to remain abolished and continues to swarm in the lungs of patients, even at times far outnumbering all the other organisms present. Evidently he is no gentleman and incapable of taking a polite hint. His German name may account for this.

With regard to prevention, we are offered the mask and what is somewhat ironically termed preventive inoculation (the "antiseptic" spray is too silly to deserve mention). The mask seems to lose its magic efficiency when worn by nurses, judging from the great number of these ladies who have contracted the disease, though masked, gowned, gloved and spectated. If, then, these very thoroughly masked people contract the disease so readily, what is the value of the rather inefficient masks worn by the public? Perhaps our advisers will advise us upon this point.

In the matter of so-called preventive inoculation, Professor Welsh tells us that it is a good thing, whilst Professor Chapman is equally certain that it is a bad thing. This, at any rate, has the advantage that, whether we are for or against this procedure, we can quote a distinguished authority in support of our contention. Whether there is sufficient antigen in the vaccines used to produce either of these effects is also an interesting question; meantime, inoculated people continue to die very effectively.

It is when we come to treatment, however, that we reach the culminating point of this monumental pile of knowledge.

Calcium lactate is the very latest weapon added to our splendid armoury. With regard to this drug, two things are sure. One is that in the patient's diet there is already more calcium than the body requires and the other is that the calcium content of the blood cannot be raised to any appreciable extent by administering more calcium. Nature very judiciously sees to it that the salts of the blood are kept at a remarkably constant level, in spite of our attempts to disturb the balance. Otherwise the results of our drugging might be more disastrous than they are.

Vaccines used for "curative" purposes are a noble tribute to the principles of homeopathy. When the patient is being overwhelmed with toxin, give him more toxin! However, the number of bacteria thus administered is so infinitesimal in proportion to the number already in the body that the process is rather like adding a quart of water to Sydney Harbour, and we hope that no great harm may result.

Lastly, we have the famous "influenza mixture" published by the guardians of our health in the daily press and duly swallowed by a confiding public.

This wonderful mixture contains, firstly, acetate of ammonium. This drug has the merit of a certain antiquity, but surely there are others with a greater claim in this direction. I believe that the Chinese have for many centuries administered cockroaches as a therapeutic agent. Why not give these a trial? Their therapeutic value would, I believe, be quite equal to that of acetate of ammonium and they would certainly be much more picturesque and impressive.

The second star in this pharmacological galaxy is *spiritus etheris nitrosi*. When mixed with water this drug loses its therapeutic properties (if any) in the course of a few hours, but perhaps one dose is expected to do the trick.

Then we come to potassium citrate. Why this was added to the mixture I do not know and I have a dark suspicion that the authors of the prescription do not know either.

But last, yet greatest of all, we have *sacch. ust.*, a fitting finale for this splendid drama of efficiency. Truly this is the crowning glory of all that has gone before. Indeed, it may be considered as a veritable microcosm, an adequate epitome of our pathology, prophylaxis and treatment.

If one could sum up in two words all the advice which our learned profession has showered upon a grateful, though perplexed, public, surely those two words would be *sacch. ust.*

Yours, etc.,

ARTHUR S. VALLACK.

233 Macquarie Street, Sydney.

(Undated.)

PNEUMONIC INFLUENZA.

Sir.—The use of quinine in ordinary influenza is so general that treatment in the present pandemic as far as Aus-

tralia is concerned is likely to include the administration of a certain amount of this drug. I have been informed by returned soldiers that up to ten grains of quinine were given to patients in each dose in the course of quinine treatment of the "influenza" in Europe.

In the absence of any definite ideas as to the causative organism, we are not in a position to arrive at any final decision as to the value of quinine in the treatment of the cases in the present pandemic. However, from the limited experience that has been available to me in private practice and in the local shire influenza hospital, it appears from clinical observations that the cases which have been treated without quinine, have done by far the best. Medical men who have so far had little or nothing to do with the present disease, naturally look for information in regard to treatment and it would be of advantage if more information were available in this respect.

In your issue of the 12th inst. the Commission appointed by the Government of New South Wales to report on the aetiology and treatment of influenza do not refer to drug treatment in their preliminary report. I am, therefore, merely recording my opinion in order that there may, as a result, be some expert advice given, based on extensive clinical experience in regard to the use of quinine. In the pneumonic influenza there is a marked lowering of the number of leucocytes in the pre-pneumonic state and the gravity of the pulmonary complications is due in part at least to infection by a hæmolytic streptococcus which greatly lengthens the coagulation time of the blood.¹ Quinine appears to be of value in ordinary influenza, yet in the present disease the plasma of convalescent patients from the influenzal pneumonia used for agglutination and complement fixation tests with five strains of the influenza bacillus and twelve different serums were uniformly negative.²

In regard to treatment of the pneumonic influenza, quinine appears to be contraindicated for the following reasons:—³

(1) Quinine arrests the movements of the white blood corpuscles and if given in sufficient quantity actually destroys them, yet in this disease we are dealing with a leucopenia.

(2) The effects of the hæmolytic streptococcus, the dyspnoea and cyanosis are evidence that the patient requires oxygen, yet the stability of the oxy-hæmoglobin is strengthened by quinine so that the blood does not yield up its oxygen as easily as normally. Quinine interferes with oxidation.

(3) Large doses of quinine lower the blood pressure considerably, depress the heart and if given in sufficiently large doses, paralyse it.

We have to deal with the heart weakened by hyperpyrexia, respiratory embarrassment and toxæmia, and administer a drug which exerts a toxic effect on the heart.

Finally we do not definitely know what organism is causing the present disease and therefore are quite unaware whether quinine if administered by the mouth has any effect.

Quinine might be of value in homeopathic doses and in solution as an oral and nasal antiseptic.

Yours, etc.,

R. A. PARKER.

"Cottesbrooke,"

Healesville, Victoria,

April 17, 1919.

PNEUMONIC INFLUENZA.

His Excellency the Governor of New South Wales issued on April 14, 1919, a proclamation varying an order dated February 5, 1919, concerning the control of vessels and passengers arriving by sea during the currency of the epidemic of influenza. It is now determined that the former order shall not apply to any vessel "which shall have been duly inspected by the Quarantine Officer of the Government of the Commonwealth on arrival at such port in New South Wales, and certified by such officer to be free from infection of the said disease as to persons on board any such vessel."

In a proclamation published in the *New South Wales Government Gazette* of April 16, 1919, it was ordered that all wholesale and retail shops other than butchers', bakers', fruit,

¹ Parke, Davis & Co.'s Therapeutic Notes under the Biologic Therapy of the Influenza Epidemic of January-February issue.

² The Medical Journal of Australia, April 12, 1919, page 306.

³ Hale White's "Materia Medica," Twelfth Edition.

refreshment and chemists' shops in the Metropolitan District of Sydney and the Municipal Areas of Adamstown, Carrington, Hamilton, Lambton, Merewether, Newcastle, New Lambton, Stockton, Wallsend, Waratah and Wickham should be closed during Easter Saturday, April 19, 1919.

In a further proclamation it was determined that all the provisions aiming at the prevention of spread of influenza should be applied to persons within the Municipal Areas of Wilcannia, Jerilderie, Blayney, Braidwood, Bathurst, Cootamundra and the Shires of Cessnock and Crookwell.

It is with regret that we have to announce the death from influenza of Dr. William Henry Elworthy, of Randwick, New South Wales, on April 16, 1919.

Medical Appointments.

Dr. W. T. Hodge (B.M.A.) has been appointed Acting District Medical Officer and Public Vaccinator at Moora, Western Australia.

The resignation of Dr. Bruce Boyle Barrack as Resident Medical Officer at the Brisbane Hospital has been accepted.

Dr. Ralph Worrall (B.M.A.) has been appointed by the Department of Public Health an Honorary Surgeon at the Coast Hospital, Sydney.

In pursuance of the provisions of *The State Children Acts, 1911 to 1917*, of Queensland, Dr. Patrick J. Kelly (B.M.A.) has been appointed Medical Officer to the State Children at St. Vincent's Orphanage, Nudgee, Queensland.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser," page xv.

Department of the Navy: Surgeons.

Department of Public Health, Queensland: Medical Officer for Venereal Clinics.

Newcastle Hospital: Resident Medical Superintendent.

Medical Appointments.

IMPORTANT NOTICE.

Medical practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, 429 Strand, London, W.C.

Branch.	APPOINTMENTS.
VICTORIA. (Hon. Sec., Medical Society Hall, East Melbourne.)	All Friendly Society Lodges, Institutes, Medical Dispensaries and other Contract Practice. Australian Prudential Association Proprietary, Limited. Mutual National Provident Club. National Provident Association.
QUEENSLAND. (Hon. Sec., B.M.A. Building, Adelaide Street, Brisbane.)	Australian Natives' Association. Brisbane United Friendly Society Institute. Cloncurry Hospital.
TASMANIA. (Hon. Sec., Macquarie Street, Hobart.)	Medical Officers in all State-aided Hospitals in Tasmania.

Branch.	APPOINTMENTS.
SOUTH AUSTRALIA. (Hon. Sec., 3 North Terrace, Adelaide.)	Contract Practice Appointments at Renmark. Contract Practice Appointments in South Australia.
WESTERN AUSTRALIA. (Hon. Sec. 6 Bank of New South Wales Chambers, St. George's Terrace, Perth.)	All Contract Practice Appointments in Western Australia.
NEW SOUTH WALES. (Hon. Sec., 30-34 Elizabeth Street, Sydney.)	Australian Natives' Association. Balmalm United Friendly Societies' Dispensary. Canterbury United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Friendly Society Lodges at Lithgow. Friendly Society Lodges at Parramatta, Auburn and Lidcombe. Leichhardt and Petersham Dispensary. Manchester Unity Oddfellows' Medical Institute, Elizabeth Street, Sydney. Marrickville United Friendly Societies' Dispensary. New South Wales Ambulance and Transport Brigade. Newcastle Collieries—Killingworth, Seaham Nos. 1 and 2, West Wallsend. North Sydney United Friendly Societies. People's Prudential Benefit Society. Phoenix Mutual Provident Society.
NEW ZEALAND: WELLINGTON DIVISION. (Hon. Sec., Wellington.)	Friendly Society Lodges, Wellington, New Zealand.

Diary for the Month.

- Apr. 29.—N.S.W. Branch, B.M.A., Medical Politics Committee; Organization and Science Committee.
- Apr. 30.—Vic. Branch, B.M.A., Council.
- Apr. 30.—Western Suburbs Med. Assoc. (N.S.W.).
- May 2.—Q. Branch, B.M.A.
- May 6.—Tas. Branch, B.M.A., Council.
- May 7.—Vic. Branch, B.M.A.
- May 9.—S. Aust. Branch, B.M.A., Council.
- May 9.—N.S.W. Branch, B.M.A., Clinical.
- May 9.—Q. Branch, B.M.A., Council.
- May 13.—N.S.W. Branch, B.M.A., Ethics Committee.
- May 15.—Vic. Branch, B.M.A., Council; Election of Representative on Representative Body.
- May 20.—Tas. Branch, B.M.A., Council.
- May 20.—N.S.W. Branch, B.M.A., Executive and Finance Committee.

EDITORIAL NOTICES.

Manuscripts forwarded to the office of this journal cannot under any circumstances be returned.

Original articles forwarded for publication are understood to be offered to *The Medical Journal of Australia* alone, unless the contrary be stated. All communications should be addressed to "The Editor," *The Medical Journal of Australia*, B.M.A. Building, 30-34 Elizabeth Street, Sydney.

The Secretary of the Victorian Branch is endeavouring to secure copies of the issues of the *British Medical Journal* of the following dates, to complete a file for one of the members. We shall be grateful to any of our readers who has a spare copy of any of the numbers sought, if he will offer them to the Secretary of the Branch:—

1915: April 3 and 10; July 10, 17, 24, 31; August 7 and 21.
1916: July 8, August 5 and 12, November 18.
1918: Title Page and Index, Volume I, and Volume II.